Marine and Freshwater Beach Testing in Massachusetts

Annual Report
2004 Season

Prepared by

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I. INTRODUCTION

A. OVERVIEW

Massachusetts has an extensive collection of recreational waters, including both freshwater and marine bathing beaches. These beaches serve as recreational resources to the local communities. Bathing beach water quality is an important public health concern, and it is of vital importance to ensure that the beaches meet all current public health standards. Recreational use of waters contaminated with microbial contamination can result in human health problems such as sore throat, gastroenteritis, or even meningitis or encephalitis (Cabelli, 1983; USEPA, 1986; Cabelli, 1989; Haile, 1996; Pruss, 1998). As a result, beach water quality is regulated to protect public health. In Massachusetts, bathing beach water quality is regulated by the Massachusetts Department of Public Health (MDPH) under Massachusetts General Law (MGL) Chapter (C) 111, § Section (S)5 and regulations cited as 105 Code of Massachusetts Regulations (CMR) 445.000: Minimum Standards for Bathing Beaches (State Sanitary Code, Chapter VII; Appendix A and B). All public and semi-public (e.g., campgrounds, motels) bathing beaches in Massachusetts must be monitored for bacterial and sometimes other types of contamination during the bathing season. The bathing beach season in Massachusetts runs from as early as Memorial Day in some areas, through Labor Day during most years.

Local boards of health (BOH), the Barnstable County Department of Health and the Environment, and the Department of Conservation and Recreation (DCR) conduct the vast majority of beach water sampling in Massachusetts. Most marine beach samples are analyzed at MDPH contracted laboratories. Most freshwater samples are analyzed at private laboratories, while some are analyzed at municipal facilities.

Bathing water samples that are found to contain levels of bacterial contamination in excess of regulatory standards are termed exceedances. If water samples from a beach are found to be in exceedance of regulatory standards, the beach must be posted as unsafe for swimming due to bacterial contamination. The general public is notified via signs posted at access points to a beach indicating the beach posting. For marine

beaches, the general public is also notified via the MDPH website, which is operated in collaboration with local health officials and MDPH contract laboratories. Local health officials and MDPH contract laboratories collect and analyze the samples and perform a majority of the data entry onto the website. MDPH is notified of exceedences within 24 hours (105 CMR 445.040). These beaches are to remain posted until the levels of bacterial contamination lower to safe levels, at which point the postings can be removed**,** and the MDPH is notified of the beach opening.

The Massachusetts Beaches Act (Appendix C) was passed in 2000, requiring all public and semi-public beaches to be tested weekly during beach season using standard indicators. In 2000, the U.S. Congress enacted the Beaches Environmental Assessment and Coastal Health (BEACH) Act that amended the Federal Water Pollution Control Act (commonly referred to as the Clean Water Act, or CWA) to improve the quality of coastal recreational waters (Appendix D). The BEACH Act seeks to reduce the risk of disease to users of the Nation's marine recreational waters through the identification of high-risk beaches, identification and mitigation of sources of pollution, and notification/risk communication to the public. It also authorizes grants to eligible states to support these objectives.

Since late 2001, MDPH has received funding from the United States Environmental Protection Agency (USEPA) that partially supports MDPH efforts to (1) develop and maintain an inventory of marine bathing beaches, (2) compile and analyze monitoring data, and (3) to conduct assessments of those beaches identified as high-risk. Based on work through the MDPH Beaches Project, MDPH has been able to make several major accomplishments in support of these goals:

Bathing Beaches Inventory

Prior to 2001, MDPH conducted a survey of Massachusetts municipalities in order to initiate the establishment of an inventory of all public and semi-public marine and freshwater beaches. Through the collection of beach water data and contacts with local boards of health, beach managers, and others, MDPH has been able to develop an inventory of over 500 marine public and semi-public beaches and over 600 freshwater public and semi-public beaches.

Bathing Beaches Mapping Project

In 2003, a detailed geographic information system (GIS) layer for Massachusetts marine bathing beaches was developed by MDPH with assistance from Applied Geographics, Inc. (AGI), and with considerable information from local health officials. State health officials, working with local health officials, identified the locations and specific boundaries of each known beach, the designations of each beach – public or semi-public (and private if known), the location or locations where the water samples are taken for routine monitoring, the location at each beach where posting (i.e., posting/closure due to bathing water quality violation) would occur in the event it is necessary, and the locations of normal access points and parking lots. All information was validated by MDPH staff who performed site visits to all marine beaches and converted this information into GIS beach layers by taking in-field readings.

Bathing Beaches Monitoring

MDPH has developed a bathing beaches monitoring database, which includes all beach monitoring data and related information reported to MDPH. MDPH has been successful at monitoring every public marine beach and most semi-public marine beaches on a weekly basis during the past three beach seasons in Massachusetts. This includes 578 sampling locations at over 500 beaches. The bathing beach season in Massachusetts runs from as early as Memorial Day in some areas, through Labor Day during most years.

Public Notification/Outreach

In 2001, MDPH initiated the development of a system that would enable the public to see which beaches were open or closed on any particular day/week, the reason behind any closure, and to keep track of a beach's water quality history. A working electronic, web-based system for public notification of marine beach postings and water quality monitoring data went online in 2003 which was developed by MDPH in conjunction with Garrison Enterprises. The website was developed with funding support from the USEPA Beaches Grant and can be reached from the home page of the MDPH website

(http://www.mass.gov/dph) or directly at:
http://www.mass.gov/dph/beha/tox/reports/beach/beaches.htm

The website supports reporting routine water quality monitoring data through a series of password protected data entry pages. The web-based system allows MDPH contract laboratories to enter sampling test results directly to the site. These laboratories are required under the MDPH contract to enter field sampling data and laboratory results into the public notification website as results become available. Data entered on the site provide as near real-time public notification as possible, after which the website automatically generates postings for those samples that exceed single-sample or geometric mean regulatory limits. Display of postings on the public pages occur twice per day, at 9:30 AM and 12:30 PM. Additional enhancements accomplished in 2004 now allow for local health officials to view postings shortly before public notification in order to give them an opportunity to post beaches and prepare for public inquiries.

Quality Assurance

A Quality Assurance Project Plan (QAPP) for routine monitoring activities and related beaches project implementation was developed and submitted to and approved by USEPA. The QAPP describes the quality assurance, quality control, and related activities, including enforcement aspects that are in place to ensure the results of the project will meet USEPA's published performance criteria.

A Quality Management Plan (QMP) for all beaches activities under the USEPA BEACH grant and other activities specific to bathing beach regulations was finalized. The QMP is a required document that describes how the program will develop, implement, and determine the effectiveness of its quality assurance and quality control policies and procedures.

The Data Submission Plan for Routine Monitoring under the USEPA BEACH grant and other activities specific to bathing beach regulations was developed, submitted to, and approved by USEPA. The Plan is a required document that describes Massachusetts' plan for submitting the beach data it collects from coastal municipalities to USEPA.

USEPA then compiles data from all states to develop a national picture of this information.

Sanitary Surveys

MDPH has developed a sanitary survey form for beaches. The development of this form allows communities to apply for sampling variances according to Massachusetts' regulations (105 CMR 445.100) and will help MDPH comply with USEPA BEACH Grant requirements for a tiered monitoring approach to sampling. During 2004, MDPH conducted two sanitary survey training sessions for local health officials to further these goals.

MDPH developed the Public Health-Based Beach Evaluation, Classification, and Tiered Monitoring Plan in order to ultimately direct water quality monitoring resources to the beaches that pose the greatest health concerns. The plan is intended to facilitate the identification and clean up of pollution problems, while those beaches with more pristine records can be monitored less often than the required weekly routine monitoring through a variance process pursuant to both the Massachusetts and federal beach acts. In this system, every public and semi-public marine bathing beach was classified as “Tier One,” “Tier Two,” or “Tier Three.” Tier One includes heavily used beaches which have pollution problems. USEPA believes that these beaches should be tested at least twice per week. Because of the ongoing pollution concerns/violations, the beaches are generally sampled more than once a week. Tier Two includes beaches with some pollution. These beaches must be tested once per week. Tier Three includes beaches with no known pollution problems. These beaches are required to be tested once every two weeks or sometimes less, as determined by MDPH through the variance process.

Training

MDPH has held numerous training sessions for local health officials during the life of the BEACH Grant. In addition to training relative to conducting sanitary surveys, topics discussed have included: health concerns related to polluted bathing water, sampling methodology and use of standardized field sampling forms, current federal and state regulations, MDPH’s new public notification website and an overview of its GPS survey

of marine beaches in Massachusetts. MDPH trainings also presented information on identifying actual and/or potential sources of contamination. Additional technical guidance has been provided in subsequent mailings to local health officials.

Laboratory Programs

MDPH has used portions of the federal beach funds to provide partial support for routine water quality compliance and monitoring for marine beaches as required under federal and Massachusetts regulations to local communities that qualified. During 2004, these laboratories analyzed over 12,000 samples from 48 marine beach communities who took part in the contract laboratory program. The contract laboratories will be audited in 2005 to ensure compliance with the QAPP and Standard Operating Procedures.

In 2004, MDPH used BEACH grant funds to contract with four laboratories (i.e., Barnstable County Department of Health and Environment Water Quality Testing Laboratory, Town of Chatham Department of Health and Environment Water Quality Laboratory, Wampanoag Environmental Laboratory, and G&L Laboratories, Inc.) to process regular weekly samples for public, marine beaches in Massachusetts, and to electronically report the data directly to MDPH. All freshwater beaches data are reported by local boards of health, as in the past. This report presents the results and analysis of these 2004 data from Massachusetts marine and freshwater bathing beaches.

II. BACKGROUND

A. INFORMATION ON BEACH WATER QUALITY

1. Health Effects from Swimming in Marine Waters

Several prospective and retrospective epidemiological studies (Cabelli, 1983; USEPA, 1986; Cabelli, 1989; Haile, 1996; Pruss, 1998) have concluded that swimming in polluted marine water poses health risks to swimmers. This conclusion is based on the observation that there is an increased rate of adverse health effects among swimmers compared to non-swimmers in marine waters. Swimming in polluted marine water can lead to gastrointestinal symptoms (e.g., nausea, vomiting, diarrhea, abdominal pain), respiratory symptoms (e.g., sore throat, cough, chest cold, runny nose, sneezing), eye and ear symptoms (e.g., irritation, earache, itchiness), dermatological symptoms (e.g., skin rash, pruritis), and constitutional symptoms (e.g., fever, chills). One retrospective study found the relative risk of gastrointestinal illness among swimmers in polluted waters to be 1.0 to 3.0 times the risk of non-swimmers (Pruss, 1998). The epidemiological studies suggest that swimmers may be exposed to pathogens (disease-causing microorganisms) while swimming. Pathogens in marine waters typically have a fecal source. Pathogens associated with human fecal matter (e.g., some strains of *Escherichia coli*) may be present in the water due to a variety of sources including but not limited to ocean disposal of sewage by boats, sewage treatment plant outfalls, illegal sewage hookups and combined sewer overflows. Bathers may also contribute significantly to pathogen concentrations in recreational waters (Gerba, 2000). Pathogens may be ingested or absorbed while swimming, thereby causing an increased risk of disease among swimmers relative to non-swimmers (Cabelli et al., 1982; Cabelli, 1983; Cabelli, 1989; Coye and Goldoft, 1989; CDC, 1990-2004; Corbett et al., 1993; Haile, 1996).

2. Beach Water Quality Testing Methods - Marine

The pathogens that cause swimming-associated disease are very difficult to measure directly. Furthermore, because of the wide variety of different pathogens that might be present in marine waters, measuring all possible pathogens is not practical for routine testing programs. Therefore, public health officials typically estimate the potential for pathogens to be present in the water by testing the water for a microorganism or a group

of microorganisms whose life cycle(s) mimics that of specific pathogens but which are easier to measure than the pathogens themselves. Because they indicate when pathogens are likely to be present, these microorganisms or groups of microorganisms are called “indicators” (Cabelli, 1983).

In the United States, concern about pathogens in marine waters typically has been related to pathogens associated with fecal contamination (Cabelli, 1983). As a result, methods commonly used in this country test for an indication of the degree of fecal contamination of the water. The most accurate indicators of fecal contamination are specific microorganisms (e.g., *Escherichia coli, Streptococcus faecalis,* or *Clostridium perfringens*) that are present predominantly in human and animal feces (Cabelli, 1983). Testing for a single indicator species, however, can fail to detect the presence of fecal pathogens if that indicator species does not survive in the natural environment for as long as the fecal pathogens themselves do (NAS, 1977). Therefore, methods that test for groups of microorganisms, such as total coliforms, fecal coliforms, or Enterococci, are frequently used instead (Cabelli, 1983). These tests are usually easier and faster to perform than those that test for specific indicator species. In the case of Enterococci, they also strongly correlate with swimming-associated disease (USEPA, 1986; Pruss, 1998). One disadvantage of using groups of microorganisms as indicators is that these tests can falsely predict the presence of fecal contamination if organisms that are not associated with fecal contamination are detected by the method (NAS, 1977; Cabelli, 1983; Barrell et al., 2000). For public health purposes however, it is prudent to respond to such indicators to prevent adverse health outcomes.

As of the year 2000, Enterococci are the required indicator organisms for determining levels of contamination at marine bathing beaches in Massachusetts. In the past, total coliforms and fecal coliforms were used as indicators for marine bathing beaches. In 2004, all marine beaches in Massachusetts that reported data used Enterococci for a routine monitoring indicator. The methods for detecting and criteria set for Enterococci are described below. The methods and criteria for fecal coliform and total coliform are also included.

a) Enterococci Method

Similar to the total and fecal coliform methods, the Enterococci method detects the number of bacteria that grow under certain laboratory conditions (USEPA, 1985). However, the Enterococci method detects fewer total species than either the fecal or the total coliform methods. The Enterococci method measures the concentration of bacteria from a group of species within the *Streptococcus* genus, some of which (e.g., *Streptococcus faecalis*) are typically found in human and animal intestines (USEPA, 1985). Because some of the species that are detected by this method are not associated with fecal contamination (USEPA, 1985), this method can produce false-positive results, like the total and fecal coliform methods. In addition, some bacterial pathogens and all viruses are not detected by this method.

In 1986, the USEPA (1986) recommended that Enterococci be used as an indicator of water quality at marine bathing beaches. This recommendation was based on studies by Cabelli (1983) at three locations (New York, NY; Boston, MA; and Lake Pontchartrain, LA). In these studies, Cabelli (1983) found that gastrointestinal symptoms reported by swimmers were strongly correlated with Enterococci levels, but not with levels of total or fecal coliforms. Additionally, in 1997 USEPA approved and adopted *Method 1600: Membrane Filter Test Method for Enterococci in Water* (USEPA, 1997). This method enabled faster turnaround time for testing of Enterococci as an indicator of water contamination, thereby making the method practical for local use. This is the method required by MDPH regulations for use in Massachusetts marine waters. In 2003, USEPA approved and adopted a number of new culture and enzyme-substrate methods for testing both Enterococci and *E. coli* in ambient water. (Jagals et al, 2000; Federal Register, 2003)

In 2003, the USEPA approved several new laboratory methods of analyzing recreational water for bacterial contamination (Jagals et al, 2000; Federal Register, 2003). In some cases, the new methods can provide results in less time than the 24-48 hours currently required. The new methods are expected to come into widespread use over the next several years.

b) Fecal Coliform Method

The fecal coliform test is similar to the total coliform test in that it measures the number of bacteria (including *Escherichia coli*) that can grow under certain laboratory conditions. However, the fecal coliform test only measures a subset of the species detected by the total coliform method. As a result, the fecal coliform test detects fewer organisms that are not associated with fecal contamination than the total coliform test, thereby reducing the chance of false-positive results. False positive results are still possible, however, because the fecal coliform method does detect some bacteria that have other sources besides human and animal feces (Cabelli, 1983). The fecal coliform method, like the total coliform method, can fail to detect waterborne pathogens in some cases because it does not detect all waterborne pathogens or viruses.

c) Total Coliform Method

The most general, but no longer recommended, testing method is the total coliform method. This method measures the number of bacteria in a water sample that will grow under certain laboratory conditions (Cabelli, 1983). A large number of different kinds of organisms are measured by this method, some of which are found exclusively in human and animal intestines (i.e., *Escherichia coli*) (Cabelli, 1983; USEPA, 1985). The advantages of this testing method are that it can be performed quickly and it is relatively sensitive to the presence of fecal contamination given the large number of species that it can detect. However, this method can falsely predict the presence of fecal pathogens because some of the species that are detected by the method (e.g., some species in the genus *Aeromonas*) are not found exclusively in human and animal feces (NAS, 1977; Cabelli, 1983). Furthermore, some waterborne pathogens (e.g., *Salmonella typhi*) and all viruses (e.g., Hepatitis A) are not detected by this method (NAS, 1977).

3. Historical and Current Water Quality Criteria - Marine

Water quality criteria are guidance concentrations that are used by public health officials to make decisions regarding the health risks associated with swimming. These criteria are typically expressed as the concentration of an indicator in the water above which there is an unacceptable risk for adverse health effects resulting from swimming. The concentrations of a microorganism in water are usually reported as the number of colony forming units (CFU) of indicators per 100 milliliters (ml) of water. For any given

measurement of the indicator species in water, the actual health risk from swimming in that water will depend on what pathogens are present in the water. Therefore, to make a decision as to the actual health risk related to a particular beach, other factors, in addition to water quality criteria for an indicator species, are important to consider (e.g., recent rainfall patterns, the number of people who use the beach).

a) Enterococci

In 1986, USEPA published *Ambient Water Quality for Bacteria – 1986*. In this document, USEPA recommended Enterococci instead of fecal or total coliforms as the indicator of marine water quality and provided a scientific rationale for its use. Rapid laboratory methods became available in the late 1990's to allow for the adoption of this indicator. Enterococci is currently the mandated indicator organism for routine monitoring of Massachusetts bathing beaches (105 CMR 445.000).

The recommended use of Enterococci was based on studies by Cabelli (1983) that tested many different indicator organisms at several beaches in the United States to see which indicator organism correlated best with the incidence of acute gastrointestinal disease among swimmers. These studies showed that the concentration of Enterococci in marine waters was more strongly correlated with the incidence of swimming-associated gastroenteritis than the concentrations of other indicators, including total and fecal coliforms. From these data, a relationship between the number of cases of swimming-associated disease and the Enterococci concentration in the water was established. USEPA (1986) used this relationship to establish the criteria for Enterococci in marine waters at 104 CFU per 100 ml for a single sample and 35 CFU per 100 ml for the geometric mean of at least five samples over a 30-day period. These criteria were set such that the expected incidence of gastrointestinal illness among swimmers would be the same as it had been for the previous USEPA water quality criteria for fecal coliform (i.e., 19 illnesses per 1000 swimmers at marine beaches). MDPH adopted this standard by regulation beginning with the 2000 bathing season.

b) Fecal Coliform

In 1968, fecal coliform replaced total coliform as the recommended indicator species for marine water quality, however, as mentioned, fecal coliform is no longer recommended under state regulations. At that time, the National Technical Advisory Council of the

Federal Water Pollution Control Administration established criteria for the geometric mean of the fecal coliform count over a 30-day period (for a minimum of five samples) at 200 CFU per 100 ml with no more than 10% of the samples exceeding 400 CFU per 100 ml. These values correlated with a level of risk of no more than 19 cases of acute gastrointestinal illness per 1,000 swimmers in marine waters. USEPA adopted this standard in 1976. By 1978, the majority of states and territories had adopted this standard as well (Cabelli, 1983; USEPA, 1986).

c) Total Coliform

Formerly, the water quality criterion used by the MDPH was based on the use of total coliforms. Specifically, the total coliform concentration could not exceed 1,000 CFU per 100 ml. After its establishment, this criterion was adopted by the Joint Committee of the American Public Health Association, the State Sanitary Engineers, and many states (Cabelli, 1983).

4. Health Effects From Swimming in Freshwater

Several studies conducted by the USEPA and others (Dufour, 1984; USEPA, 1986; Cabelli, 1989; CDC, 1991-2004) have observed gastrointestinal symptoms (e.g., nausea, vomiting, diarrhea, abdominal pain) as a result of swimming in fresh waters. The results of these studies have suggested that swimmers may be exposed to pathogens while swimming in fresh waters. Pathogens associated with human fecal matter may be present in fresh waters as a result of system failures in human sewage treatment facilities, or rainfall and resulting surface water runoff and other factors. Leachate from septic systems may be a potential source of microbiological contamination as well as animal wastes subject to runoff (e.g., wastes from dogs or farms). Swimmer-to-swimmer contamination is another potential source for microbiological contamination. Swimmers, bathers, waders, surfers, and others who come into full- or most-body contact with swimming water may all contribute to contamination (California, 1997; Gerba, 2000).

5. Beach Water Quality Testing Methods – Freshwater

As indicated in the regulation (105 CMR 445.031) (see Appendix A), the indicator organisms for freshwater bathing beaches are *E. coli* and Enterococcus based on

research conducted by USEPA (Dufour, 1984; USEPA, 1986). The Enterococcus method has previously been discussed.

a) E. coli Method

Escherichia coli (*E. coli*) is a species of bacteria that is found exclusively in human and animal intestines (USEPA, 1985). Certain strains of this species are enteric (i.e., intestinal) pathogens (NAS, 1977). While both the total and fecal coliform methods can detect *E. coli* as part of a group of organisms, the *E. coli* method tests specifically for the presence or absence of this particular species. Because *E. coli* is exclusively found in human and animal intestines, this method is a very sensitive indicator of fecal contamination for freshwater beaches (USEPA, 1985).

6. Current Water Quality Criteria – Freshwater

As noted previously, for any given measurement of the indicator species in water, the actual health risk from swimming in that water will depend on what pathogens are present in the water. Therefore, to make a decision regarding the health risk related to a particular beach, other factors must be considered in addition to water quality criteria for indicator species, such as recent rainfall patterns and the number people who use the beach.

a) E. coli

For freshwater, no single *E. coli* sample shall exceed 235 CFU per 100 ml and the geometric mean of the most recent five *E. coli* samples within the same bathing season shall not exceed 126 CFU per 100 ml. These are the criteria established in MDPH regulations (105 CMR 445.031).

b) Enterococci

For freshwater, no single Enterococci sample shall exceed 61 CFU per 100 ml and the geometric mean of the most recent five Enterococci samples within the same bathing season shall not exceed 33 CFU per 100 ml. These are the criteria established in the regulations (105 CMR 445.031).

Both *E. coli* and Enterococci standards are based on studies (Dufour, 1984; USEPA, 1986) that showed a strong correlation between levels of *E. coli* and Enterococci and rates of swimmer-associated gastrointestinal disease in freshwaters. The values are set to a level of risk of no more than eight cases of acute gastrointestinal disease per 1,000 swimmers in freshwater beaches.

B. MDPH ACCOMPLISHMENTS - 2004

1. Beaches Website

In 2004, the electronic, web-based system for public notification of marine beach postings and water quality monitoring data was further enhanced to enable all MDPH contract laboratories to enter sampling test results directly to the web site. These laboratories were required under contract to enter field sampling data and laboratory results into the MDPH public notification website as the results became available. The system automatically generated beach postings on the website when samples were submitted that exceed accepted water quality standards. Display of these postings on the public pages occurs twice per day, at 9:30 AM and 12:30 PM. This allows for local health officials to be able to see the postings shortly before the public and gave them an opportunity to post beaches and prepare for public inquiries.

In support of these efforts, MDPH conducted training sessions for the contract laboratories on the subject of performing data entry into the MDPH website. Additional training sessions were held for local health officials of marine communities opting not to utilize MDPH contracted laboratories for the 2004 beach season. This laboratory performed data entry provided for greater quality control and reliability of reporting as well as near real-time public notification. BOHs in communities that chose not to utilize the MDPH contract laboratories were provided limited access to the web site for inputting their community's test results. Training on data entry was provided on-site by MDPH staff for these communities. Only one non-contract laboratory provided data entry for one community. For six communities with extremely limited resources, MDPH staff provided data entry assistance.

All MDPH standardized forms related to beach monitoring were updated and made available for download on the MDPH Beaches website. These include the Field

Sampling Form, Postings Fax Form, Posting Sign Form and Tier III Sanitary Survey Form.

During the beach season, the website can be reached from the home page of the MDPH website at (http://www.mass.gov/dph) by clicking on the “Beaches Initiative” hyperlink or directly at (http://www.mass.gov/dph/beha/tox/reports/beach/beaches.htm). Beach postings and current/historical data can be viewed by clicking on a series of maps to select an individual community (Figures 25 and 26). Once the community is selected, a listing of all marine beaches in that community is displayed along with the status of the beach (Figure 27). The website automatically generates postings as samples are entered for those that exceed single-sample or geometric mean regulatory limits. The data displayed on the website is updated twice daily during the beach season.

2. Beach Mapping Project

In 2004, the Massachusetts marine bathing beach layers were added to the MassGIS Website (http://www.mass.gov/mgis/). These layers represent the linear extent of each beach, and points marking beaches' boundaries and access, sampling, and other locations. The beach layers display information over 500 marine bathing beaches, including over 400 public and over 90 semi-public beaches, as well as the estimated mileage of public (153.1 miles), semi-public (50.7 miles), and private beaches (522.4 miles) in Massachusetts.

3. Tiered Monitoring - Sanitary Surveys

MDPH staff, in collaboration with the Barnstable Department of Health and the Environment, developed a sanitary survey form for local health officials, beach managers, and others to use to systematically assess sanitary conditions at beaches. The development of this form allows communities to apply for sampling variances according to Massachusetts’ regulations (105 CMR 445.100) and will help MDPH comply with USEPA Beach Grant requirements for a tiered monitoring approach to sampling. In addition, MDPH staff and Mr. George Heufelder (Director of the Barnstable County Department of Health and Environment) conducted two sanitary survey training

sessions for local health officials to further these goals. The sessions were held in Plymouth and Beverly to maximize geographic outreach.

4. Training

In July 2004, MDPH held training sessions for conducting sanitary surveys to local health officials. These training sessions were held in Plymouth and Beverly, MA to ensure adequate coverage for all marine beach communities. In conjunction with Barnstable County Department of Health and Environment, MDPH presented information on identifying actual and/or potential sources of contamination and the use of the MDPH standardized sanitary survey form. In addition, MDPH conducted an open forum for local health officials to provide feedback on the 2003 Beaches Project. MDPH also conducted training sessions for the contract laboratories and communities not using the contracted laboratories on performing data entry to the MDPH website.

In October, MDPH staff attended the USEPA National Beaches Conference in San Diego, CA. The staff attended various workshops and gave a presentation entitled: The Massachusetts Experience: Development of a Beaches Data Management Infrastructure and Reporting System.

5. Laboratory Programs

In 2004, MDPH again provided partial funding support to local communities for routine compliance and monitoring as required under Massachusetts regulations 105 CMR 445.000, Minimum Standards for Bathing Beaches, State Sanitary Code Chapter VII. Enlisting the services of contract laboratories provided this funding. MDPH Requests for Responses (RFR) were posted on the Commonwealth Procurement Access and Solicitation System (Comm-PASS) professional services open solicitation section. The evaluation criteria were grouped into sample collection, management, and value. The contract awards were based on the outcome of this process. Unlike 2003, the contracts awarded were able to be renewed on a yearly basis for a maximum of three additional years. MDPH received responses and proposals from seven laboratories and awarded four contracts. The laboratories selected were Barnstable County Department of Health and Environment Water Quality Laboratory, Chatham Water Quality Laboratory, G & L Laboratories, and the Wampanoag Environmental Laboratory. These laboratories

analyzed 5,565 marine beach samples from 50 marine beach communities during the 2004 bathing beach season.

6. Press Event

On July 13, 2004, the Commonwealth of Massachusetts and USEPA sponsored a Press Event at Carson Beach in South Boston, MA. At this event, the USEPA spoke about its Clean New England Beaches initiative and announced the award of an additional grant, under the authority of the Federal BEACH Act, to the MDPH to continue its bathing beach project. MDPH spoke about its accomplishments, including announcing the release of its annual beach monitoring data report. MDPH staff presented a live bathing water sampling demonstration. Massachusetts Water Resources Authority was also present to speak about the Combined Sewer Overflow (CSO) plan for South Boston beaches, which will substantially reduce the volume of discharges to Dorchester Bay and adjacent beaches. Speakers included USEPA Regional Administrator Robert Varney, MDPH Associate Commissioner Suzanne Condon, as well as other state and local officials. The event generated widespread public interest and national press coverage.

III. METHODS

A. SAMPLE COLLECTION

State agencies that operate bathing beaches and local boards of health from the communities in Massachusetts that have public and semi-public bathing beaches are required to submit to MDPH beach field data and laboratory results for bathing beaches under their jurisdiction. The data collected by each community are recorded on a beach sampling field data collection form (Appendix E) developed by MDPH. For communities having public, marine beaches and utilizing MDPH-contracted laboratories, these data were submitted electronically to MDPH via a secure Internet connection. These data were displayed on the beaches website in near real-time for public notification of beach closures and test results. Several marine beach communities opted to utilize non-MDPH contracted laboratories in 2004. These communities were Dartmouth, Ipswich, Kingston, Marion, Manchester-by-the-Sea, Mattapoisett, New Bedford, Newbury, Rockport and Westport. The boards of health or health departments of these communities either faxed the data to MDPH beach inspectors, who entered the data, or these communities entered the data directly onto the beaches website for prompt public notification. MDPH staff provided training to local health officials on how to use the website for data reporting.

Sample collection was required to be in compliance with the *Standard Methods for the Examination of Water and Waste Water* of the American Public Health Association or as approved by the USEPA. The information collected in 2004 included:

- Name of beach
- Community where beach is located
- Number of postings at each beach
- Beach designation, public, semi-public, or private
- Sample identification number
- Date of sample collection
- Time of sample collection
- Weather condition at time of sample collection
- Air temperature
- Wind direction

- Time of last high tide (if applicable)
- Number of days from end of most recent rainfall to sample collection day
- Amount of most recent rainfall
- Sampling agency (i.e., local board of health, DCR, outside laboratory, other)
- Known pollution sources (i.e., boats, wildlife, septic systems, outflow pipes, streams)
- Beach type (i.e., marine or freshwater)
- Bather density (i.e., number of people in the water)
- Water temperature
- Water clarity
- Observations (i.e., trash, sludge deposits, oils, algae, fish die-off, jellyfish, birds)
- Indicator (i.e., Enterococci for marine, Enterococci or *E. coli* for freshwater; note, two communities with freshwater beaches still used the fecal coliform and total coliform indicator (Rockland and Marlborough), which is not in compliance with the 105 CMR 445.031)
- Indicator level in colony forming units (CFU) of bacteria per 100 ml of water
- Exceedance (i.e., indicator levels equal to or greater than 104 CFU / 100 ml for Enterococci in marine waters, 61 CFU / 100 ml for Enterococci in fresh waters, or 235 CFU / 100 ml for *E. coli* in fresh waters)
- Comments

B. LABORATORY ANALYSIS

Laboratory analysis of samples was required to be in compliance with the *Standard Methods for the Examination of Water and Waste Water* of the American Public Health Association or as approved by the USEPA. Laboratories that were contracted by MDPH to perform public, marine beach sample analysis were further required to utilize the Modified Enterococci Method (Method 1600), as described in the USEPA's March 2000 document (EPA/821/R-97/004), "Improved Enumeration Methods for the Recreational Water Quality Indicators: Enterococci and *Escherichia coli*". These laboratories were required to report exceedances of bacterial water quality standards to MDPH and local boards of health as soon as analyses were completed and results available.

C. DATA REPORTING

In 2004, MDPH contracted laboratories inputted information from the field sampling forms and analytical results for marine beaches electronically as soon as results were available. The electronic data were posted on the MDPH public notification website in order to provide public notification of marine bathing beach water quality and beach closings in near real-time. Local BOHs that did not utilize MDPH contract laboratories faxed their sampling results to MDPH staff who entered the data onto the beaches website. Local health officials faxed bacterial exceedances and corresponding beach postings, as well as pre-emptive beach postings to MDPH within 24 hours of occurrence. In accordance with 105 CMR 445.000, freshwater sampling forms and analytical results were faxed or mailed to MDPH by local health officials. This information was due by October 31st. MDPH staff entered all of these data into a database for inclusion in this annual report, as well as in support of USEPA reporting requirements under the 2004 BEACH Grant. The USEPA Beach Grant mandates that MDPH must report all routine monitoring sampling data and laboratory results, as well as beach postings, electronically on an annual basis.

D. DATA VALIDATION

All data were validated and checked for completeness by MDPH personnel using faxed copies of field and laboratory reports sent by local boards of health. Local boards of health and laboratories were contacted directly, as necessary, to resolve questions and discrepancies in the reports.

E. PUBLIC NOTIFICATION

Under Massachusetts law (MGL C 111, § 5S), the local board of health is required to post signs at the entrance(s) to a beach within 24 hours of being notified that the beach did not meet water quality standards. In addition, the local board of health is required to notify MDPH that the beach has been posted and that standard signs have been put up at key access points to the beach within 24 hours. In 2003, using funding provided as part of the USEPA Beaches Grant, MDPH established a website for displaying sampling results and beach postings for all public, marine beaches in the state. In 2004, MDPH contracted laboratories inputted data from the field sampling forms and analytical results

for marine beaches electronically as soon as results were available. In addition, notification that a public marine beach had been posted (i.e., signs put up) is entered electronically via the beaches website if there has been an exceedance of Enterococci. The analytical results and beach posting information were displayed on the public website in near real-time. Verification of the posting was sent on a standard posting form by fax to MDPH by local health officials within 24 hours of occurrence.

F. LIMITATIONS

The ability of MDPH to provide prompt public notification of beach water quality monitoring results is limited by both the completeness and accuracy of the data reported, as well as on the consistent use of scientifically proven indicator organisms and analytical techniques. The electronic reporting system and public beaches website has vastly improved the accuracy and quality of marine data submitted in 2004. In 2004, Massachusetts achieved 100% compliance in the use of the state and federally mandated Enterococci indicator organism testing among public marine beaches reporting routine monitoring results. Additionally, MDPH provided training to local health officials concerning the electronic reporting of data using the beaches website in preparation for the 2004 bathing beach season. The use of proper and consistent sampling procedures is an important step in ensuring the quality of data reported. As a result of training, the use of standardized field sampling forms and the participation of contracted laboratories, consistency in the format and completeness of data reported continues to improve.

For the 2004 beach season, the MDPH was successful at collecting data from 99% of the communities with open freshwater beaches. The amount of data and quality submitted from each community, however, varied greatly. During the beach season, each community utilizes different monitoring techniques. Therefore, the comprehensiveness of data varies among communities. Currently, with the exception of exceedances, which are required to be reported to the MDPH within 24 hours, freshwater beach data are normally reported once during the year, which is after the end of the beach season. As a result, MDPH personnel can only review the data for proper sample collecting and testing techniques.

Another limitation, related to the specificity of analytical methods, is that the data are indicator-, not pathogen-, specific. As a result, the data only suggest a potential for the presence of pathogens that can cause human disease. The presence or absence of specific pathogens is not assayed. The use of indicators implies that water meeting the criteria may harbor disease-causing microorganisms and also that water considered unsafe may not carry any disease-causing microorganisms (e.g., Polo et al., 1998; Moore et al., 2001; Prieto et al., 2001; Schindler, 2001). This is an inherent limitation of using indicators as a test of water quality, in Massachusetts and elsewhere. However, it does need to be emphasized that a substantial body of scientific research generally supports the use of these indicators as described earlier in this document (Cabelli, 1983; USEPA, 1986).

The criteria developed for each indicator are set at a specific level of risk of an adverse health effect, in this case gastrointestinal (GI) illness, not at a no-risk level. The indicator limits recommended by USEPA for Enterococci in marine waters are associated with a risk level of 19 GI illnesses / 1000 swimmers (EPA, 1986). Therefore, levels of indicators considered in compliance by the Massachusetts and national requirements do not imply freedom from risk of adverse health effects for the total population at risk.

Finally, acceptable levels of risk are typically determined by the incidence of GI symptoms among swimmers compared to that for non-swimmers. While research has shown that GI is the most sensitive outcome, it should be noted, however, that pathogens found in marine and freshwater can cause other symptoms, including respiratory, dermatologic, ophthalmologic, and constitutional.

IV. RESULTS

During the 2004 bathing season, all marine and the vast majority (188 out of 193) of freshwater communities in Massachusetts with public and semi-public marine and/or freshwater beaches sent water quality data to MDPH. In total, MDPH received water quality data from 219 Massachusetts communities collected from 508 marine and 607 freshwater beaches. Due to the length of some beaches in Massachusetts, multiple sampling locations are necessary to distinguish specific areas of water quality. Therefore, for the purposes of this report, a sample location is considered a single beach. Thus based upon 578 marine beach sample locations there are a total of 1,185 public and semi-public marine and freshwater beaches. In total, MDPH received 15,181 water samples from marine and freshwater beaches collected during the 2004 beach season. These data represent approximately 98 percent of the 224 Massachusetts communities that have marine and/or freshwater beaches. There are 31 communities that have only marine bathing beaches, 164 communities that have only freshwater beaches, and 29 that have both marine and freshwater bathing beaches within their limits. The remaining 127 communities have no public or semi-public bathing beaches (Table 1). Private marine or private freshwater bathing beaches are not included in the scope of this report.

Summaries and analyses of the marine and freshwater bathing beach data are presented in Tables 1 – 26 and Figures 1 – 24. The data are divided by type of beach (marine vs. freshwater) to allow easy comparison to earlier reports that analyzed marine bathing beaches only (e.g., MDPH, 1997) and to accommodate the different testing criteria for the two types of beaches (see Background section). The data were analyzed according to type of beach, presence or absence of data, bather density, pollution source, bacterial indicator, frequency of testing, organization that performed testing, exceedances based on current Massachusetts criteria, and beach postings. Data are grouped according to either community, beach, or individual water sample in order to facilitate understanding and interpreting the results. For example, bather density at a given beach changes during the day and season, so it makes sense to express these data in terms of bather density at the time an individual water sample was taken. Alternatively, testing frequency only makes sense in terms of a given beach. The data

are presented in tabular (Tables 1- 26), pie graph and chart (Figures 1 – 11, 16 - 24), and map (Figures 12 – 15) forms.

A. MARINE BEACHES

During the 2004 bathing season, all of the 60 Massachusetts coastal communities with known public and semi-public marine bathing beaches submitted beach monitoring data to MDPH (Tables 3a and 4, Figure 1). Ten Massachusetts's coastal communities do not have public or semi-public marine bathing beaches (i.e., Chelsea, Everett, Fall River, Freetown, Berkeley, Dighton, Gosnold, Peabody, Rowley and Saugus) (see Table 3a). The 60 communities, which have known public and semi-public marine bathing beaches, accounted for 578 sampling locations at 508 public or semi-public marine bathing beaches. A total of 7,868 water samples were collected from public and semi-public beaches and reported to MDPH during the 2004 bathing beach season (Table 4). Bather density data were collected as part of routine sampling during 2004. Massachusetts's regulations require samples to be taken within the area of greatest bather density (105 CMR 445.000). Global Positioning System (GPS) surveys of marine beaches completed by MDPH in 2003 and observations by MDPH beach inspectors confirm that samples are being taken within the area of greatest bather density. A majority of the samples were collected at times where bather density consisted of 10 individuals or less (Table 5).

As part of sample collection, environmental observations are recorded and reported to MDPH. In 2004, ten percent of marine samples recorded a potential environmental pollution source (Table 6). The potential sources most commonly noted are the presence of algae (54%), birds (30%), and trash (10%) (Table 7).

The majority of public and semi-public marine beaches in Massachusetts were tested with the required frequency in 2004. More than 96% of the marine beaches were tested daily or weekly (Table 11). The marine beaches that did not test with the required frequency were all semi-public marine beaches in close proximity to beaches that were tested weekly. Communities that did not test all their beaches with the required frequency have been contacted and provided guidance on the regulations. MDPH contract laboratories performed the majority of sampling at marine beaches during 2004,

accounting for over 70% of the samples reported (Table 12). Local health departments and DCR performed the remainder of the marine beach water sampling.

The total number of marine beach postings (i.e., verification to MDPH that a sign has been posted at the beach) increased from 148 in 2003 to 288 in 2004. The total number of exceedances of the marine water quality standard (104 cfu/100ml Enterococci) also increased from 310 in 2003 to 338 in 2004 (Tables 13 and14).

Total rainfall amounts during the summer of 2004 at many Massachusetts beaches were comparable to the amounts measured in the summer of 2003 (Tables 20 and 21). The month to month rainfall amount did vary from 2003. Boston had a slightly wetter summer and Chatham had a slightly drier summer.

Of the 578 public or semi-public marine beaches, 157 (27%) incurred at least one bacterial exceedance (Table 14). Of the 336 marine beach samples that exceeded regulatory limits, 90 occurred near locations identified as pollution sources during the MDPH GPS survey of marine beaches conducted in 2003 (mostly outfall pipes). Table 21 shows the number of exceedances both near and away from identified pollution sources. In 2004, sample sites having identified pollution sources nearby incurred bacterial exceedances in 5.5% of samples taken, whereas sampling locations with no known pollution sources nearby incurred exceedances in 3.9% of samples taken.

B. FRESHWATER BEACHES

During the 2004 bathing season, 188 of the 193 Massachusetts communities with known public and semi-public freshwater bathing beaches submitted beach monitoring data to MDPH (Tables 3a, 3b, 4, 19 and Figure 2). Of the five communities that did not report data for 2004, four (i.e., Dartmouth, Franklin, New Bedford, and Weymouth) did not open the freshwater beaches in their communities. Kingston is the only community that did not submit data for open freshwater beaches. The number of communities that maintain public or semi-public freshwater beaches in Massachusetts has been refined after communicating with each individual community as to their presence. Further outreach to all 351 Massachusetts communities will continue by MDPH personnel in 2005 in an

effort to achieve full compliance with beaches regulations. The 188 communities contain 607 public or semi-public freshwater bathing beaches and collected a total of 7,313 freshwater samples that were reported to MDPH during the 2004 bathing beach season (Table 4).

In terms of bather density (Table 5), the data look similar to that of marine beaches, with a high percentage (65%) indicating low bather density (0-10 bathers on the beach) during sampling. Approximately 40% of samples taken at freshwater beaches were obtained during non-peak bathing hours, either before 10:00 am or after 4:00 pm (Table 23).

In 2004, only 4.8% of samples recorded an environmental observation (Table 6). The observations most commonly noted are the presence of birds and algae at freshwater beaches (Table 7). Birds are indicated over 55% of the time and algae are noted 24% of the time observations are recorded.

In 2004, local boards of health used *E. coli* as an indicator organism for the majority of freshwater beaches (84%) in Massachusetts (Table 9). Of the remaining 16% of beaches, all used Enterococci except for Marlborough, which continued to test exclusively for Total Coliform (Table 10). This community will be targeted for outreach before the 2005 season.

The majority of public and semi-public freshwater beaches in Massachusetts were tested with the required frequency in 2004. More than 94% of the freshwater beaches were tested at least weekly (Table 11). As noted, communities that did not test all their beaches with the required frequency have been contacted and provided guidance on the regulations. Local health departments were responsible for a majority of samples collected at freshwater beaches, accounting for 51% of samples reported to MDPH (Table 12). Independent laboratories and the DCR performed the remainder of sampling at freshwater beaches.

The number of exceedances of freshwater water quality standards (235 cfu/100ml *E. coli* and 61 cfu/100ml Enterococci) decreased from 333 in 2003 to 267 in 2004 (Table 13). This was important because of the consistent amount of rainfall (Table 20 and 21) during

the year and the number of samples collected and reported was higher in 2004 (7,313 samples versus 6,492 samples in 2003).

V. DISCUSSION

A. ANALYSIS OF RESULTS

With the passage of the Massachusetts Beaches Act in 2000, the state adopted the USEPA recommended Enterococci as the standard indicator for water quality monitoring at marine beaches. Since the institution of the MDPH contract laboratories and website, marine beaches in Massachusetts have universally adopted the use of Enterococci as an indictor organism (Table 9). Enterococci were the indicator used for all 7,868 water samples taken at marine beaches in 2004. The use of MDPH contracted laboratories for processing public, marine beach water samples helped to facilitate uniform compliance with the MDPH regulation, along with trainings conducted for local health officials and others in July 2004 in Beverly and Plymouth.

In 2004, MDPH continued to see improvements in the number of communities complying with bathing beach water quality reporting requirements. All marine communities and nearly 100% of freshwater communities reported bathing beach water data to MDPH. A significant improvement for both marine and freshwater quality is the increased compliance and public notification figures for 2004. A higher proportion of data submitted included needed field data and beach postings. This follows a general trend over the past several years, where a greater number of communities are submitting more bathing water results for more beaches (see Figures 22-24).

There was an increase in the number of postings and exceedances at marine beaches in 2004. Several factors were likely involved in this increase. The overall number of samples taken from marine sample locations increased from 7,439 in 2003 to 7,868 in 2004. However, the incidence of marine beach exceedances remained consistent from 2003 to 2004. In 2004, 4.3% of samples exceeded the Enterococcus standard (Table 13), while 4.2% of samples exceeded that standard in 2003. The quality of reporting has also improved due to the electronic reporting requirement. MDPH received a higher percentage of exceedance postings (86% in 2004 versus 48% in 2003) for marine beaches. An exceedance may not result in a new posting if the beach is already posted due to a previous exceedance.

For freshwater beaches, there was a decrease in the number of exceedances. The decrease in exceedances is important since more beach water sample results were reported (7,313 in 2004 versus 6,492 in 2003). In 2004, 3.7% of samples exceeded their respective indicator standard (Table 13), while 5.1% of samples exceeded that standard in 2003. In 2004, there were 103 beach postings reported to MDPH for exceedances, which remained the same from the previous year. Overall, MDPH received a higher percentage of exceedance postings (39% in 2004 opposed to 30% in 2003) for freshwater beaches. Again, an exceedance may not result in a posting if the beach is already posted due to a previous exceedance. The low percentage of postings reported may reflect a need for increased awareness of Massachusetts beach water quality reporting requirements among health departments of freshwater communities. Efforts that were made by MDPH staff to obtain posting information included directly contacting communities both during and after beach season to explain regulations and to provide standardized reporting forms, as well as making both the forms and regulations available for download from the MDPH website.

The observations made by samplers at marine beaches may help to explain some contributing factors to the elevated indicator levels (Table 8). Of the 761 samples collected from marine beaches that recorded a potential environmental pollution source, 7.9% exceeded the Enterococci regulatory limit. The remaining marine beach samples that did not indicate an environmental source only exceeded the regulatory limit 3.9% of the time. This may mean that the potential sources of pollution observed (e.g., algae, birds, trash) are in fact impacting the water quality. Environmental observations made at freshwater beaches did not seem to contribute to the percentage of exceedences. However, it should be noted that only 10% of marine samples and 4.8% of freshwater samples recorded a potential environmental pollution source.

In 2004, the amount of rainfall at most beaches in Massachusetts was near average for the beach season. Tables 20 and 21 show rainfall totals and deviation from the norm for the months of June, July and August, from 2001 through 2004. Stormwater runoff associated with wet weather has been shown to be a significant source of sewage contamination at bathing beaches (Cabelli et al, 1982; Cabelli, 1989; Preuss, 1998; Gerba, 2000; Schindler, 2001). Many Massachusetts communities have begun to address combined sewer overflows and stormwater runoff problems in response to

USEPA's new stormwater regulations. Construction commenced on many large and small-scale projects and will be completed in the coming beach seasons. Future water quality improvements are expected to continue with the assistance of better monitoring, reporting, and new infrastructure projects.

Figures 16 - 20 show the number of exceedances reported and the amount of rainfall on the corresponding date by region and beach type. For marine beaches, the correlation between storm events and the number of exceedances is strong (Figure 16). Freshwater beaches tend to show the same tendencies, but freshwater beaches are influenced more by environmental factors such as waste solids and algae (Figure 17). As shown in Table 24, the number of exceedances reported was significantly higher within 24 hours of a rain event. For instance, the greatest number of single day exceedances in Massachusetts in 2004 was in the Cape Cod region on August 31st. More than two inches of rain fell in Falmouth on August 31st and subsequently 33 exceedances were reported. Of the samples that recorded the number of days since a rain event, approximately 69% of the marine exceedances and 78% of the freshwater exceedances occurred within 24 hours of a rain event. Additionally, Figure 21 shows an exponential decrease in the number of exceedances in bathing beach water samples as the number of days increase from rain events.

Most of the beaches that had consistently elevated indicator levels in 2003 greatly reduced the number of exceedances in 2004. Tables 25 and 26 compare the beach water monitoring data at marine and freshwater beaches that had the highest percentage of exceedances during the 2003 season and the corresponding data in 2004. On Table 25, Cockle Cove Creek Beach in Chatham was the only marine beach that had a high percentage of exceedances in 2003 to have a higher percentage of exceedances in 2004. Because of the consistent elevated indicator levels and the sampling history of the beach, Chatham decided to preemptively close this beach for the entire beach season. The remaining marine beaches reduced the total number of exceedences from 49 in 2003 to 14 in 2004. Table 26 displays the 2003 and 2004 data for freshwater beaches. Similar to the marine beach results, only one beach had a higher percentage of exceedances in 2004. Overall, the total number of exceedances for these beaches dropped from 69 in 2003 to 33 in 2004.

As in previous years, more than half of the marine beach samples (79%) and freshwater beach samples (65%) who reported bather density indicated low bather density (0-10 bathers on the beach) during sampling. This can largely be attributed to samples being taken in off-peak hours for swimming. More than 60% of samples taken at marine beaches were obtained either before 10:00 AM or after 4:00 PM (Table 23). Approximately 15% of the samples were collected between 12 PM and 4:00 PM. Samples are collected primarily before 12:00 PM so that laboratories can begin analyzation before holding times expire after six hours. Therefore, the bather density data should be considered low.

Through an improved understanding of the relationships between rainfall and bacterial exceedances as well as pollution sources and exceedances, MDPH and local health officials have enhanced protection of the public health using pre-emptive closures and timely monitoring.

B. FUTURE PLANS

Complete Flagship Beach Projects

In 2005, MDPH will complete the Flagship Beach projects at Willow's Pier Beach in Salem, Wollaston Beach in Quincy and Ryder Street Beach in Provincetown. Detailed sanitary surveys of the beaches will be completed, identifying all possible sources of contamination at these beaches. In addition, focused sampling studies will be completed at each of the beaches. The results of the surveys will be summarized in a final report.

Laboratory Audits

MDPH will conduct Quality Assurance/Quality Control audits of its routine monitoring contract laboratories to ensure good laboratory practices for the laboratory analysis of bathing water samples. MDPH will perform the audits in consultation and accordance with the checklist developed with the assistance of the Massachusetts Department of Environmental Protection's Wall Experiment Station.

Direct Web-based Reporting

In 2005, MDPH contracted laboratories, local boards of health and others will continue to perform data entry to the electronic, web-based public notification website. A history of postings will be maintained on the website to facilitate analysis of the data for future annual reports. This will provide more accurate recordkeeping so that trends can be analyzed in future annual reports. Data entry pages on the website will be enhanced to improve usability for the laboratories and local boards of health. These enhancements will include improved use of selection lists and immediate feedback to maintain active real time data quality control and consistency of data entered into the system.

Training and Outreach

MDPH plans to continue its support of communities' bathing water monitoring efforts by continuing to offer training sessions in current regulations, sampling techniques and the use of standardized reporting forms. MDPH will also extend its training efforts to freshwater communities. In addition, MDPH will conduct training in performing sanitary surveys to further its goal of completing a Tiered Monitoring Project. As recent as March 2005, MDPH gave a presentation on how to conduct sanitary surveys at the USEPA and New England Interstate Water Pollution Control Commissioner (NEIWPCC) co-sponsored workshop entitled "Reducing and Preventing Beach Closures in Northern New England Communities." Many local, state, and federal beach managers and officials were in attendance. MDPH will also provide refresher training in the use of the MDPH website for entering bathing water monitoring data. This training is focused on contract laboratories and other organizations performing data entry during the coming beach season.

Tiered Monitoring

MDPH will facilitate sanitary surveys in support of Tiered Monitoring Plans and variances during 2005. When the tiered monitoring plan is adopted at specific beaches, a "high" priority beach will receive the most frequent water quality sampling and analysis. Such a beach might be one with high bather volume, high frequency or percentage of exceedances, problematic sources of pollution, or a combination of these factors. A

“medium” priority beach will be sampled once per week and will still be required to meet water quality standards. Beaches that are tiered “medium” can have any of the factors listed for “high” priority beaches but with less frequency or intensity of any of the three criteria. A “low” priority beach is one that is relatively pristine. Low priority beaches are eligible for less frequent testing, as infrequently as every 30 days under 105 CMR 445.000, if the local health department receives a testing variance. Data from the 2004 bathing season will be incorporated into the existing tiered monitoring plan to update the published classifications.

VI. SUMMARY

This report summarizes beach monitoring and testing data from Massachusetts public and semi-public marine and freshwater bathing beaches in the 2004 season. In total, 219 of the 224 communities with bathing beaches reported 15,181 water samples collected at 1,185 beaches. In 2004, the state of beaches in Massachusetts continued to show improvements in terms of the number communities and beaches reporting data. Marine and freshwater beaches showed improvement during the 2004 beach season. The percentage of exceedances at marine beaches remained consistent from 2003, even with more than 400 samples collected during the 2004 beach season. The data reported for marine beaches was also more complete. MDPH received 38% more postings of exceedances than in 2003, which translates to either improved compliance with the regulations by BOHs or reporting to MDPH. In addition, 100% of the marine beach samples were tested for the correct regulatory indicator. Freshwater bathing beach monitoring data showed a significant improvement in 2004. Ninety-nine percent of the beaches tested used the correct regulatory indicators for freshwater, and the percentage of postings versus exceedances received by MDPH was higher in 2004. MDPH received data from more communities and more beaches than in any previous year while fewer exceedances were reported at freshwater beaches.

This report highlights that better compliance with posting requirements continues when bacterial exceedances occur at marine beaches. MDPH continues to provide training and information to local communities in an effort to improve compliance in this area. MDPH continues to make improvements in its public notification website to make sure this information is available to the public as soon as it becomes available. In addition, MDPH is continuing to focus efforts on the most vulnerable beaches through its Tiered Monitoring Plan and Flagship Beach projects.

VII. ACKNOWLEDGMENTS

This study would not have been possible without the efforts and cooperation of and collaboration with the local health departments in the Massachusetts (including Barnstable County). MDPH also received much assistance from many local and regional organizations, including DCR, who have maintained cooperative assistance in ensuring bathing beaches are tested and their data is forwarded to MDPH in a timely fashion. Finally, we are grateful to the USEPA for providing financial support. USEPA Beach Grant funds have helped support efforts in areas related to public marine beach data reporting and notification, including the public notification website, laboratory analysis of routine monitoring samples, the Flagship Beach project, training and enforcement activities.

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IX. TABLES

Table 1

All Massachusetts communities grouped by the presence and/or absence of marine and freshwater public and semi-public bathing beaches in 2004.

Type of community	Number (#)	Percentage (%)
Marine beach only	31	8.8%
Freshwater beach only	164	46.7%
Marine and freshwater beaches	29	8.3%
No beaches	127	36.2%
Total	351	100

Table 2

All Massachusetts communities grouped according to the presence or absence of data for marine or freshwater public and semi-public bathing beaches in 2004.

Type of community	#	%
Marine or freshwater beach, with data	219	62.4%
Marine or freshwater beach, without data	5	1.4%
No beaches	127	36.2%
Total	351	100%

Table 3a

Water quality testing at marine and freshwater public and semi-public bathing beaches in Massachusetts, grouped by community, for the years 2004, 2003, 2002, 2001, 1996, and 1995.

Coastal communities												
Type of community	2004		2003[a]		2002		2001[a]		1996		1995	
	#	%	#	%	#	%	#	%	#	%	#	%
Coastal communities with marine bathing beaches	60	86%	60	86%	59	84%	59	84%	60	86%	60	86%
Coastal communities with marine bathing beaches for which data were obtained	60	100%	60	100%	59	100%	58	98%	53	88%	52	87%
Coastal communities with marine bathing beaches for which no data were obtained	0	0%	0	0%	0	0%	1	2%	7	12%	8	13%
Coastal communities without marine bathing beaches	10	14%	10	14%	11	16%	11	16%	10	14%	10	14%
Total number of coastal communities	70	100	70	100	70	100	70	100	70	100	70	100

a - The number of communities with marine beaches was adjusted as the inventory became more complete over time.

Table 3b

Water quality testing at freshwater public and semi-public bathing beaches in Massachusetts, grouped by community, for the years 2004, 2003, 2002, 2001, 1996, and 1995.

All cities/towns												
Type of community	**2004[a]**		**2003**		**2002**		**2001**		**1996**		**1995**	
	#	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Communities with freshwater bathing beaches	193	55.0%	197	56.1%	194	55.3%	175	49.9%	N/A	N/A	N/A	N/A
Communities with freshwater bathing beaches for which data were obtained	188	97.4%	157	79.7%	158	81.4%	145	82.9%	N/A	N/A	N/A	N/A
Communities with freshwater bathing beaches for which no data were obtained	5	2.6%	40	20.3%	36	18.6%	30	17.1%	N/A	N/A	N/A	N/A
Communities without freshwater bathing beaches	158	45.0%	154	43.9%	157	44.7%	176	50.1%	N/A	N/A	N/A	N/A
Total number of communities	351	100	351	100	351	100	351	100	N/A	N/A	N/A	N/A

a - The number of communities with beaches was adjusted as the inventory became more complete over time.

Table 4

Water quality testing at marine and freshwater public and semi-public bathing beaches in Massachusetts in 2004, grouped by community, beach, and sample.

Type of community	# communities (total)	# communities with data	# beaches[1] tested	# samples
Communities with marine bathing beaches	60	60	578	7,868
Communities with freshwater bathing beaches	193	188	607	7,313
		Total	1,185	15,181

1. Note this table does not include number of beaches not tested, as data was not compiled to accurately determine this number.

IX. TABLE 5

Bather density at marine and freshwater public and semi-public bathing beaches in Massachusetts in 2004, at times when samples were taken.

Marine beaches		
Bather Density (# people)	**# Samples**	**%**
0-10	6,204	78.9%
10-20	328	4.2%
20-50	211	2.7%
>50	52	0.7%
Not indicated	1,073	13.6%
Total	7,868	100.0%
Freshwater beaches		
Bather Density (# people)	**# Samples**	**%**
0-10	4,745	64.9%
10-20	170	2.3%
20-50	129	1.8%
>50	2	0.0%
Not indicated	2,267	31.0%
Total	7,313	100.0%

Table 6

Reported existence of open or obvious sources of pollution that might affect the water quality at public and semi-public bathing beaches in Massachusetts in 2004, reported during routine sampling.

Marine Beaches		
Pollution source [1]	**# Samples**	**%**
Yes	768	9.8%
No	0	0.0%
Not indicated	7,100	90.2%
Total	7,868	100.0%
Freshwater Beaches		
Yes	350	4.8%
No	0	0.0%
Not indicated	6,963	95.2%
Total	7,313	100.0%

[1]. Pollution sources noted on field sampling forms during routine monitoring

Table 7

Reported source of pollution for public and semi-public bathing beaches in Massachusetts in 2004 for which a pollution source was specified.

Marine Beaches		
Sources	**# Beaches**	**%**
Trash	77	10.1%
Waste Solids	11	1.4%
Sludge Deposits	1	0.1%
Oils	5	0.7%
Algae	411	54.0%
Fish die-offs	3	0.4%
Jellyfish	24	3.2%
Birds	229	30.1%
Total	761	100.0%
Freshwater Beaches		
Trash	21	6.0%
Waste Solids	24	6.9%
Sludge Deposits	4	1.1%
Oils	10	2.9%
Algae	84	24.0%
Fish die-offs	11	3.1%
Jellyfish	1	0.3%
Birds	195	55.7%
Total	350	100.0%

Table 8

Number of exceedances for public and semi-public beaches which reported environmental sources of pollution Massachusetts in 2004

Marine beaches			
	# of Exceedances	**# of Samples**	**%**
Recorded environmental pollution source	60	761	7.9%
No recorded pollution source	276	7,107	3.9%
Exceedance[1]	336	7,868	4.3%
Freshwater beaches			
Recorded environmental pollution source	13	350	3.7%
No recorded pollution source	254	6,963	3.6%
Exceedance[1]	267	7,313	3.7%

Table 9

Water quality bacterial indicators used to test marine public and semi-public bathing beaches in Massachusetts in 2004, grouped by sample.

Marine Beaches		
Indicator[1]	**# Samples**	**%**
Enterococcus	7,868	100%
E. coli	0	0%
Fecal coliform	0	0%
Total coliform	0	0%
Fecal streptococcus	0	0%
Not indicated	0	0%
Total	7,868	100%
Freshwater Beaches		
Enterococcus	1,145	15.7%
E. coli	6,126	83.8%
Fecal coliform	7	0.1%
Total coliform	33	0.5%
Fecal streptococcus	0	0.0%
Not indicated	2	0.0%
Total	7,313	100.0%

1. Massachusetts state guidelines indicate that Enterococcus be used to test marine beaches and either *E.coli* or Enterococci be used to test freshwater beaches for potential bacterial contamination.

Table 10

Water quality bacterial indicators or combinations of indicators used to test public and semi-public bathing beaches in Massachusetts in 2004, grouped by beach.

Marine Beaches		
Indicator(s)	**# Beaches**	**%**
Enterococcus only	578	100%
E. coli only	0	0%
Fecal coliform only	0	0%
Total coliform only	0	0%
Enterococcus and *E. coli*	0	0%
Enterococcus and Fecal coliform	0	0%
Enterococcus and Total coliform	0	0%
Enterococcus, Fecal coliform, and Total coliform	0	0%
Not indicated	0	0%
Total	578	100%
Freshwater Beaches		
Enterococcus only	68	11%
E. coli only	526	87%
Fecal coliform only	0	0%
Total coliform only	5	1%
Enterococcus and *E. coli*	7	1%
E. Coli and Fecal coliform	1	0%
E. Coli and Total coliform	0	0%
Enterococcus, Fecal coliform, and Total coliform	0	0%
Not indicated	1	0%
Total	607	100%

1. Each of the rows in this table is independent of the others (e.g., the number of beaches tested for Enterococcus and *E. coli* together is not included in the number of beaches tested for Enterococcus only).

2. Beaches that use multiple indicators usually do not use them on a consistent basis (e.g., water samples on a given date are tested with one indicator, while those tested on a different date are tested with another indicator).

Table 11

Frequency of water quality testing at public and semi-public bathing beaches in Massachusetts in 2004, grouped by beach and frequency.

Marine Beaches		
Test frequency	**# Beaches**	**%**
Daily	14	2.4%
Weekly	542	93.8%
Unknown	8	1.4%
Two times	4	0.7%
One time	10	1.7%
Total	578	100.0%
Freshwater Beaches		
Weekly	565	93.1%
Unknown	4	0.7%
Monthly	7	1.2%
Twice per month	4	0.7%
Twice per week	5	0.8%
Three times	5	0.8%
Two times	3	0.5%
One time	14	2.3%
Total	607	100.0%

Table 12
Groups, agencies, or individuals who collected water samples at public and semi-public bathing beaches in Massachusetts in 2004.

Marine Beaches		
Testing organization	**# Samples**	**%**
Local Health Department	1,235	15.7%
Department of Conservation/ Division of Urban Parks and Recreation (DCR-DUPR))	978	12.4%
Department of Conservation/Division of State Parks and Recreation (DCR-DSPR)	79	1.0%
Outside lab	5,565	70.7%
Other	11	0.1%
Total	7,868	100.0%
Freshwater Beaches		
Local Health Department	3,747	51.2%
Department of Conservation/ Division of Urban Parks and Recreation (DCR-DUPR))	67	0.9%
Department of Conservation/Division of State Parks and Recreation (DCR-DSPR)	936	12.8%
Outside lab	2,546	34.8%
Other	17	0.2%
Total	7,313	100.0%

Table 13

The number of samples in which the measured Enterococcus concentration (marine beaches) or Enterococcus or *E. coli* concentration (freshwater beaches) exceeded their respective water quality criteria at public and semi-public bathing beaches in Massachusetts in 2004.

Marine beaches		
Concentration	**# Samples**	**%**
Exceedance[1]	336	4.3%
Non-exceedance	7525	95.6%
Indeterminant[2]	7	0.1%
Total	7,868	100.0%
Freshwater beaches		
Concentration	**# Samples**	**%**
Exceedance[1]	267	3.7%
Non-exceedance	7,004	95.8%
Indeterminant[2]	42	0.6%
Total	7,313	100.0%

1. For marine beaches, Enterococcus is the indicator species. A sample is said to be in exceedance if the number of colony forming units (CFU) / 100 ml is greater than 104 for a single sample or greater than 35 for the average of 5 samples over a 30-day period. For freshwater beaches, either Enterococcus or *E. coli* can be used as indicator species. For Enterococcus, a sample is said to be in exceedance if the number of CFU / 100 ml is greater than 61 for a single sample or greater than 33 for the average of at least 5 samples over a 30-day period. For *E. coli*, a sample is said to be in exceedance if the number of CFU / 100 ml is greater than 235 for a single sample or greater than 126 for the average of at least 5 samples over a 30-day period.

2. Indeterminant means that an indicator other than those recommended by current guidelines was used, no indicator was reported, or no level was reported.

Table 14

The number of beaches in which at least one measured Enterococcus concentration (marine beaches) or at least one Enterococcus or E. coli concentration (freshwater beaches) exceeded their respective water quality criteria at public bathing beaches in Massachusetts in 2004.

	# beaches with at least one exceedance	Total # beaches reporting	%
Marine beaches	157	578	27.2%
Freshwater beaches	126	607	20.8%

Table 15

The number of exceedances at marine and freshwater public and semi-public bathing beaches in Massachusetts in 2004, grouped by indicator species.

Marine Beaches			
Indicator	Total # Samples collected	Total # samples exceeding criterion	% samples exceeding criterion
Enterococcus	7,868	336	4%
E. coli	0	N/A	N/A
Fecal coliform	0	N/A	N/A
Total coliform	0	N/A	N/A
Fecal streptococcus	0	N/A	N/A
Not indicated	0	N/A	N/A
Total	7,868	336	4%
Freshwater Beaches			
Indicator	Total # Samples collected	Total # samples exceeding criterion	% samples exceeding criterion
Enterococcus	1,143	97	8%
E. coli	6,128	170	3%
Fecal coliform	7	N/A	N/A
Total coliform	33	N/A	N/A
Fecal streptococcus	0	N/A	N/A
Not indicated	2	N/A	N/A
Total	7,313	267	4%

Table 16

The number of exceedances and postings at marine and freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Marine beaches	
Exceedances, Total (Enterococcus)	336
Postings, Total[1]	288
Postings, Enterococcus	265
Postings, Geomean	7
Postings, Preemptive Rainfall	15
Postings, Preemptive Pollution	1
Freshwater beaches	
Exceedances, Total	267
Exceedances, Enterococcus	97
Exceedances, E. Coli	170
Postings, Total[1]	103
Postings, Enterococcus	54
Postings, E. Coli	46
Postings, Lack of Testing	2
Postings, Preemptive Pollution	1

1. Total postings does not necessarily equal total exceedances because some tests that resulted in exceedance may have occurred while the beach was closed, or beach closings covered multiple parts of a beach that were counted as separate beaches in this report.

Table 17

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Aquinnah	Lobsterville	Weekly	Enterococci	10				
Aquinnah	Moshup Beach	Weekly	Enterococci	10				
Aquinnah	Philbin Beach	Weekly	Enterococci	10				
Aquinnah	Red Beach	Weekly	Enterococci	10				
Barnstable	Bone Hill	Weekly	Enterococci	13				
Barnstable	Bridge Street	Weekly	Enterococci	16	2	340	376	
Barnstable	Cordwood Road	Weekly	Enterococci	14	1	130	130	
Barnstable	Covell's	Weekly	Enterococci	14				
Barnstable	Cotuit Bay Shores Association	Weekly	Enterococci	13	1	118	118	
Barnstable	Craigville	Weekly	Enterococci	14				
Barnstable	Crocker's Neck	Weekly	Enterococci	14	1	128	128	1
Barnstable	Cross Street	Weekly	Enterococci	13				
Barnstable	Dowses	Weekly	Enterococci	14				
Barnstable	East (Town) Beach	Weekly	Enterococci	14	1	170	170	
Barnstable	Estey Avenue	Weekly	Enterococci	13				
Barnstable	Indian Trail	Weekly	Enterococci	13				
Barnstable	Kalmus Ocean	Weekly	Enterococci	15	1	195	195	
Barnstable	Kalmus Yacht	Weekly	Enterococci	15	1	400	400	
Barnstable	Kennedy Memorial	Weekly	Enterococci	16	2	190	300	
Barnstable	Keyes	Weekly	Enterococci	14				
Barnstable	Little River Road	Weekly	Enterococci	13				
Barnstable	Loops	Weekly	Enterococci	14				
Barnstable	Millway	Weekly	Enterococci	15	1	186	186	
Barnstable	Oregon	Weekly	Enterococci	13				
Barnstable	Oyster Harbors Club	Weekly	Enterococci	12				
Barnstable	Oyster Place	Weekly	Enterococci	14	1	150	150	
Barnstable	Prince Cove	Weekly	Enterococci	18	5	112	400	3
Barnstable	Ropes	Weekly	Enterococci	15	1	276	276	
Barnstable	Sandy Neck	Weekly	Enterococci	15	1	182	182	
Barnstable	Scudder Lane	Weekly	Enterococci	14	1	110	110	
Barnstable	Seaside Park Improvement Association	Weekly	Enterococci	12				
Barnstable	Veterans	Weekly	Enterococci	16	1	120	120	
Barnstable	Wianno Avenue	Weekly	Enterococci	13				

Table 17

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Barnstable	Wianno Club (salt)	Weekly	Enterococci	12				
Beverly	Brackenbury	Weekly	Enterococci	11				
Beverly	Dane Street	Weekly	Enterococci	11				
Beverly	Goat Hill	Weekly	Enterococci	12	1	115	115	1
Beverly	Independence Park	Weekly	Enterococci	9				1
Beverly	Lynch Park	Weekly	Enterococci	12	1	146	146	1
Beverly	Mingo	Weekly	Enterococci	11				
Beverly	Obear Park	Weekly	Enterococci	11				
Beverly	Rice	Weekly	Enterococci	1				
Beverly	Rice	Weekly	Enterococci	11				
Beverly	Sandy Point	Daily	Enterococci	47	5	115	174	1
Beverly	West	Weekly	Enterococci	15				
Beverly	Woodbury	Weekly	Enterococci	16	1	380	380	1
Boston	Carson Beach (DCR - DUPR)	Daily	Enterococci	57	3	150	1400	4
Boston	Carson Beach (DCR - DUPR)	Daily	Enterococci	56	5	113	500	2
Boston	City Point Beach @ Point (DCR - DUPR)	Daily	Enterococci	56	1	125	125	
Boston	Constitution (DCR - DUPR)	Daily	Enterococci	57	9	105	5000	2
Boston	Constitution (DCR - DUPR)	Daily	Enterococci	56	5	135	2500	2
Boston	Constitution (DCR - DUPR)	Daily	Enterococci	57	8	120	1700	2
Boston	Lovell's Island (DCR - DUPR)	Weekly	Enterococci	10				
Boston	M Street Beach @ M Street (DCR - DUPR)	Daily	Enterococci	57				
Boston	Malibu (DCR - DUPR)	Weekly	Enterococci	12	1	124	124	1
Boston	Pleasure Bay (DCR - DUPR)	Daily	Enterococci	56	5	108	1000	2
Boston	Savin Hill (DCR - DUPR)	Weekly	Enterococci	12				
Boston	Tenean (DCR - DUPR)	Daily	Enterococci	52	8	127	1500	2
Bourne	Barlows Landing	Weekly	Enterococci	14				
Bourne	Briarwood Marine and Science	Weekly	Enterococci	8				
Bourne	Cataumet	Weekly	Enterococci	13				
Bourne	Cedar Point Association	Weekly	Enterococci	12				
Bourne	Electric Avenue	Weekly	Enterococci	13				
Bourne	Gilder Road Beach	Weekly	Enterococci	13				
Bourne	Hideaway Village Association	Weekly	Enterococci	12				

Table 17

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Bourne	Monument	Weekly	Enterococci	14				
Bourne	Patiusset Beach	Weekly	Enterococci	15	1	250	250	
Bourne	Pocasset Beach Improvement Association	Weekly	Enterococci	12				
Bourne	Sagamore	Weekly	Enterococci	14				
Bourne	Scenic Park	Weekly	Enterococci	10				
Bourne	Scraggy Neck Recreation Association	Weekly	Enterococci	12				
Bourne	Tahanto Associates, Inc.	Weekly	Enterococci	12				
Bourne	Wings Neck Trust Association (North Beach)	Weekly	Enterococci	12				
Bourne	Wings Neck Trust Association (South Beach)	Weekly	Enterococci	12				
Braintree	Fore River Smith Beach	Weekly	Enterococci	13				
Brewster	Breakwater Landing	Weekly	Enterococci	12				
Brewster	Cape Cod Sea Camps Bay	Weekly	Enterococci	12				
Brewster	Crosby Landing	Weekly	Enterococci	12				
Brewster	Ellis Landing	Weekly	Enterococci	12				
Brewster	Linnell Landing	Weekly	Enterococci	12				
Brewster	Paines Creek	Weekly	Enterococci	12				
Brewster	Point of Rocks	Weekly	Enterococci	12				
Brewster	Robbins Hill	Weekly	Enterococci	12				
Brewster	Saints Landing	Weekly	Enterococci	12				
Chatham	Bucks Creek	Weekly	Enterococci	18	3	125	193	2
Chatham	Cockle Cove	Weekly	Enterococci	13				
Chatham	Cockle Cove Creek	Weekly	Enterococci	17	10	152	578	2
Chatham	Cockle Cove Creek	Weekly	Enterococci	18	7	133	290	8
Chatham	Forest Beach Road	Weekly	Enterococci	13				
Chatham	Hardings	Weekly	Enterococci	13				
Chatham	Hardings	Weekly	Enterococci	13				
Chatham	Jacknife Harbor	Weekly	Enterococci	13				
Chatham	Lighthouse	Weekly	Enterococci	13				
Chatham	Oyster Pond	Weekly	Enterococci	13				
Chatham	Pleasant Street	Weekly	Enterococci	13				
Chatham	Ridgevale	Weekly	Enterococci	14				

Table 17

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Chatham	Scateree	Weekly	Enterococci	13				
Chilmark	Great Rock Bight	Weekly	Enterococci	17				
Chilmark	Menemsha	Weekly	Enterococci	11				
Chilmark	Ocean @ Chilmark Pond Preserve	Weekly	Enterococci	21				
Chilmark	Ocean @ Lucy Vincent Beach	Weekly	Enterococci	13				
Chilmark	Squibnocket Beach	Weekly	Enterococci	12				
Cohasset	Bassing's (Sailing Club)	Weekly	Enterococci	13	1	116	116	1
Cohasset	Black Rock	Weekly	Enterococci	15				
Cohasset	Little Harbor	Weekly	Enterococci	11				
Cohasset	Sandy	Weekly	Enterococci	15				1
Cohasset	Sandy Cove	Weekly	Enterococci	12				
Danvers	Sandy Beach	Weekly	Enterococci	11	1	755	755	1
Danvers	Sandy Beach	Weekly	Enterococci	8	1	870	870	1
Dartmouth	Anthony's	Weekly	Enterococci	13				
Dartmouth	Apponagansett Town Beach	Weekly	Enterococci	13				
Dartmouth	Bayview	Weekly	Enterococci	13				
Dartmouth	Demarest Lloyd (DCR - DSPR)	Weekly	Enterococci	15				
Dartmouth	Hidden Bay	Weekly	Enterococci	13	1	620	620	1
Dartmouth	Jones Town Beach	Weekly	Enterococci	13				
Dartmouth	Moses Smith Creek	Weekly	Enterococci	13	1	154	154	1
Dartmouth	Nonquitt	Weekly	Enterococci	13				
Dartmouth	Oak Hill Shores	Weekly	Enterococci	13				
Dartmouth	Round Hill	Weekly	Enterococci	12				
Dartmouth	Salter's Point East	Weekly	Enterococci	14				
Dartmouth	Salter's Point South	Weekly	Enterococci	14				
Dennis	Bayview	Weekly	Enterococci	12				
Dennis	Chapin Memorial	Weekly	Enterococci	13				
Dennis	Cold Storage	Weekly	Enterococci	12				
Dennis	Corporation	Weekly	Enterococci	13				
Dennis	Follins Pond	Weekly	Enterococci	13	1	368	368	1
Dennis	Glendon	Weekly	Enterococci	12				
Dennis	Haigis	Weekly	Enterococci	12				

Table 17

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Dennis	Harborview	Weekly	Enterococci	14	2	130	400	
Dennis	Howes	Weekly	Enterococci	12				
Dennis	Inman Road	Weekly	Enterococci	13				
Dennis	Mayflower	Weekly	Enterococci	14	1	110	110	
Dennis	Raycroft	Weekly	Enterococci	12				
Dennis	Sea Street	Weekly	Enterococci	13				
Dennis	Sea Street East	Weekly	Enterococci	12				
Dennis	South Village	Weekly	Enterococci	12				
Dennis	Sullivan (Depot St.)	Weekly	Enterococci	12				
Dennis	Trotting Park	Weekly	Enterococci	12				
Dennis	West Dennis	Weekly	Enterococci	15	2	140	284	2
Dennis	West Dennis	Weekly	Enterococci	14				
Dennis	West Dennis	Weekly	Enterococci	14				
Duxbury	Duxbury	Weekly	Enterococci	14				
Duxbury	Landing Road	Weekly	Enterococci	17	4	120	350	7
Duxbury	Residents Beach	Weekly	Enterococci	13				
Duxbury	Shipyard Lane	Weekly	Enterococci	16	1	160	160	1
Duxbury	West End	Weekly	Enterococci	13	1	565	565	1
Eastham	Boat Meadow	Weekly	Enterococci	14	1	400	400	1
Eastham	Campground	Weekly	Enterococci	13				
Eastham	Coast Guard	Weekly	Enterococci	10				
Eastham	Coast Guard	Weekly	Enterococci	11				
Eastham	Cole Road	Weekly	Enterococci	13				
Eastham	Cook's Brook	Weekly	Enterococci	14				
Eastham	Dyer Prince	Weekly	Enterococci	14	1	132	132	
Eastham	First Encounter	Weekly	Enterococci	16	1	167	167	1
Eastham	First Encounter	Weekly	Enterococci	13				
Eastham	Kingsbury	Weekly	Enterococci	13				
Eastham	Nauset Light	Weekly	Enterococci	13				
Eastham	Nauset Light	Weekly	Enterococci	13	2	126	400	2
Eastham	Nauset Light	Weekly	Enterococci	12				
Eastham	Sunken Meadow	Weekly	Enterococci	13				
Eastham	Thumpertown	Weekly	Enterococci	14	1	400	400	
Eastham	Town Cove	Weekly	Enterococci	13				
Edgartown	Bend in the Road	Weekly	Enterococci	10				

Table 17

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Edgartown	Chappy Point Beach	Weekly	Enterococci	8				
Edgartown	East Beach (Chappy)	Weekly	Enterococci	8				
Edgartown	Felix Neck	Weekly	Enterococci	10				
Edgartown	Fuller Street	Unknown	Enterococci	4				
Edgartown	Joseph Sylvia State Beach	Weekly	Enterococci	10				
Edgartown	Joseph Sylvia State Beach	Weekly	Enterococci	10				
Edgartown	Norton Point Beach	Weekly	Enterococci	9				
Edgartown	Norton Point Beach	Weekly	Enterococci	9				
Edgartown	Norton Point Beach	Weekly	Enterococci	8				
Edgartown	Norton Point Beach	Weekly	Enterococci	8				
Edgartown	Ocean @ Edgartown Great Pond	Weekly	Enterococci	9				
Edgartown	South Beach State Park	Weekly	Enterococci	6				
Edgartown	South Beach State Park	Weekly	Enterococci	8				
Edgartown	South Beach State Park	Weekly	Enterococci	7				
Edgartown	Wasque Swim Beach	Weekly	Enterococci	8				
Essex	Clammer's Beach	Weekly	Enterococci	16				
Essex	Front	Weekly	Enterococci	16				
Fairhaven	Fort Phoenix (DCR - DSPR)	Weekly	Enterococci	11				
Fairhaven	Manhattan Avenue	Weekly	Enterococci	10				
Fairhaven	Raymond Street	Weekly	Enterococci	10				
Fairhaven	West Island Causeway	Weekly	Enterococci	10				
Fairhaven	West Island Town Beach	Weekly	Enterococci	10				
Falmouth	Acapesket Improvement Association	Weekly	Enterococci	9				
Falmouth	Bikepath Beach	Weekly	Enterococci	16	3	172	346	1
Falmouth	Bristol	Weekly	Enterococci	14				
Falmouth	Bristol	Weekly	Enterococci	12				
Falmouth	Chapoquoit	Weekly	Enterococci	14	1	400	400	1
Falmouth	Chapoquoit Associates - Front Beach	Weekly	Enterococci	10				
Falmouth	Chapoquoit Associates - Little Beach	Weekly	Enterococci	10				
Falmouth	Falmouth Associates - 564 Surf Drive	Weekly	Enterococci	10				

Table 17

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Falmouth	Falmouth Heights	Weekly	Enterococci	15	1	280	280	1
Falmouth	Falmouth Heights	Weekly	Enterococci	14				
Falmouth	Falmouth Yacht Club	Weekly	Enterococci	10				
Falmouth	Little Island Beach Preserve	Weekly	Enterococci	10				
Falmouth	Megansett	Weekly	Enterococci	12				
Falmouth	Menauhant	Weekly	Enterococci	14				
Falmouth	Menauhant	Weekly	Enterococci	14				
Falmouth	Mill Road	Weekly	Enterococci	14	1	114	114	1
Falmouth	New Silver (Silver Beach Improvement Association)	Weekly	Enterococci	11				
Falmouth	Nobska Beach Association	Weekly	Enterococci	10				
Falmouth	Old Silver 1	Weekly	Enterococci	28	2	400	400	1
Falmouth	Old Silver 2	Weekly	Enterococci	13	1	400	400	1
Falmouth	Old Silver 2	Weekly	Enterococci	12				
Falmouth	Old Silver Estates	Weekly	Enterococci	10				
Falmouth	Saconessett Hills Association	Weekly	Enterococci	10				
Falmouth	Seacoast Shores Associates, Inc.	Weekly	Enterococci	10				
Falmouth	Shorewood Association	Weekly	Enterococci	12	2	188	208	
Falmouth	Sippewissett Beach Trust	Weekly	Enterococci	10				
Falmouth	Sippewissett Highlands Trust	Weekly	Enterococci	10				
Falmouth	Stoney Beach (MBL)	Weekly	Enterococci	13				
Falmouth	Surf Drive	Weekly	Enterococci	15	1	200	200	1
Falmouth	Surf Drive	Weekly	Enterococci	14	1	138	138	1
Falmouth	Wild Harbor	Weekly	Enterococci	12	2	120	174	
Falmouth	Wood Neck Beach	Weekly	Enterococci	15	1	386	386	1
Falmouth	Wood Neck River	Weekly	Enterococci	14	1	360	360	1
Gloucester	Cressy's	Weekly	Enterococci	13	1	262	262	1
Gloucester	Good Harbor	Weekly	Enterococci	13				
Gloucester	Good Harbor Creek	Weekly	Enterococci	13				
Gloucester	Half Moon	Weekly	Enterococci	13	1	530	530	3
Gloucester	Niles	Weekly	Enterococci	13	1	412	412	1
Gloucester	Pavillion	Weekly	Enterococci	13	1	158	158	1
Gloucester	Plum Cove	Weekly	Enterococci	13	1	254	254	1
Gloucester	Wingearsheek	Weekly	Enterococci	13				

Table 17

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Harwich	Allen Harbor	Twice	Enterococci	2				
Harwich	Atlantic Avenue	Weekly	Enterococci	13				
Harwich	Ayer Lane Assoc (Quason Rd)	Unknown	Enterococci	4				
Harwich	Bank Street (Bayview Rd)	Weekly	Enterococci	15				
Harwich	Bayview	Weekly	Enterococci	14				
Harwich	Brooks	Weekly	Enterococci	13				
Harwich	Earl Road	Weekly	Enterococci	13				
Harwich	Grey Neck	Weekly	Enterococci	13				
Harwich	Merkel Beach (Snow Inn Road)	Weekly	Enterococci	14				
Harwich	Neel Road	Weekly	Enterococci	14				
Harwich	Riverside Harbor (Wixon Dock)	Once	Enterococci	1				
Harwich	Old Mill Point Association	Weekly	Enterococci	14	2	178	382	
Harwich	Old Mill Point Association	Weekly	Enterococci	12				
Harwich	Pleasant Bay	Weekly	Enterococci	14				
Harwich	Pleasant Road	Weekly	Enterococci	14				
Harwich	Red River	Weekly	Enterococci	15	1	116	116	1
Harwich	Riverside Harbor (Wixon Dock)	Once	Enterococci	1				
Harwich	Seabreeze	Weekly	Enterococci	14				
Harwich	The Belmont	Weekly	Enterococci	12				
Harwich	Wah Wah Taysee Road	Weekly	Enterococci	15	2	110	400	
Harwich	Wequasett Inn Resort	Weekly	Enterococci	13				
Harwich	Zylpha	Weekly	Enterococci	13				
Hingham	Belair	Weekly	Enterococci	10				
Hingham	Cliff Road	Weekly	Enterococci	8				
Hingham	Kimball	Weekly	Enterococci	10				
Hingham	Melville	Weekly	Enterococci	9				
Hingham	North	Weekly	Enterococci	10				
Hingham	Seal Cove	Weekly	Enterococci	10				
Hingham	Town Beach	Weekly	Enterococci	10				
Hingham	Wampatuck	Weekly	Enterococci	12	2	126	230	2
Hingham	Yacht Club	Weekly	Enterococci	10				

Table 17

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Hull	A Street Bay Side	Weekly	Enterococci	13	1	200	200	1
Hull	A Street Ocean	Weekly	Enterococci	12				
Hull	Darcy's	Weekly	Enterococci	12				
Hull	Edgewater	Weekly	Enterococci	12				
Hull	Gunrock	Weekly	Enterococci	12				
Hull	Helen Street	Weekly	Enterococci	12				
Hull	Kenburma	Weekly	Enterococci	12				
Hull	Nantasket (DCR - DUPR)	Weekly	Enterococci	12				
Hull	Nantasket (DCR - DUPR)	Weekly	Enterococci	12				
Hull	Nantasket (DCR - DUPR)	Weekly	Enterococci	12				
Hull	Nantasket (DCR - DUPR)	Weekly	Enterococci	12				
Hull	Newport	Weekly	Enterococci	12				
Hull	Spring Street	Weekly	Enterococci	12				
Hull	Whitehead	Weekly	Enterococci	12				
Hull	XYZ	Weekly	Enterococci	12				
Ipswich	Clark	Weekly	Enterococci	14				
Ipswich	Crane	Weekly	Enterococci	14				
Ipswich	Little Neck	Weekly	Enterococci	15				
Ipswich	Pavillion	Weekly	Enterococci	15				
Ipswich	Pavillion	Weekly	Enterococci	15				
Ipswich	Steep Hill	Weekly	Enterococci	16				
Kingston	Gray's	Weekly	Enterococci	17	1	175	175	
Kingston	Rocky Nook	Weekly	Enterococci	16				
Lynn	Kings (DCR - DUPR)	Weekly	Enterococci	14	3	118	198	2
Lynn	Kings (DCR - DUPR)	Weekly	Enterococci	11	2	106	162	2
Lynn	Lynn (DCR - DUPR)	Weekly	Enterococci	14	3	178	340	2
Manchester-by-the-Sea	Black	Weekly	Enterococci	13				
Manchester-by-the-Sea	Magnolia	Weekly	Enterococci	15				
Manchester-by-the-Sea	Manchester Bath & Tennis	Weekly	Enterococci	10				
Manchester-by-the-Sea	Singing	Weekly	Enterococci	14				
Manchester-by-the-Sea	Singing	Weekly	Enterococci	14				
Manchester-by-the-Sea	Tuck's Point	Weekly	Enterococci	14				
Manchester-by-the-Sea	West Manchester	Weekly	Enterococci	14	2	110	190	2
Manchester-by-the-Sea	White	Weekly	Enterococci	14				
Marblehead	Crocker Park	Weekly	Enterococci	9				

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Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Marblehead	Devereux	Weekly	Enterococci	15	1	460	460	1
Marblehead	Gas House	Weekly	Enterococci	15	1	220	220	
Marblehead	Grace Oliver	Weekly	Enterococci	15	1	440	440	1
Marblehead	Stramski	Weekly	Enterococci	17	3	185	310	7
Marblehead	Sunset Road	Weekly	Enterococci	13				
Marblehead	Village Street	Weekly	Enterococci	13				
Marion	Beverly Yacht	Twice	Enterococci	2				
Marion	Converse Point	Weekly	Enterococci	8				
Marion	Dexter Lane	Once	Enterococci	1				
Marion	Island Wharf	Weekly	Enterococci	11				
Marion	Oakdale Avenue	Weekly	Enterococci	13	1	910	910	5
Marion	Planting Island	Weekly	Enterococci	11				
Marion	River Road	Weekly	Enterococci	13	3	164	40	11
Marion	Silver Shell	Weekly	Enterococci	11				
Marion	Silver Shell	Weekly	Enterococci	11				
Marion	Tabor Academy	Weekly	Enterococci	11				
Marion	Tabor Academy	Weekly	Enterococci	11				
Marshfield	Brant Rock	Weekly	Enterococci	9				
Marshfield	Fieldston	Weekly	Enterococci	9				
Marshfield	Fieldston	Weekly	Enterococci	9				
Marshfield	Green Harbor	Weekly	Enterococci	10	1	115	115	
Marshfield	Rexhame	Weekly	Enterococci	9				
Mashpee	Callies Beach	Weekly	Enterococci	12				
Mashpee	Mashpee Neck Road Landing	Weekly	Enterococci	12				
Mashpee	Maushup Village	Weekly	Enterococci	12				
Mashpee	New Seabury Inn	Weekly	Enterococci	12				
Mashpee	Poponesset	Weekly	Enterococci	12				
Mashpee	Poponesset Spit	Weekly	Enterococci	13	1	214	214	
Mashpee	Seconsett Island Causeway	Weekly	Enterococci	13	1	110	110	1
Mashpee	South Cape Beach (DCR - DSPR)	Weekly	Enterococci	12				
Mashpee	South Cape Civic Association	Unknown	Enterococci	4				
Mattapoisett	Town Beach	Weekly	Enterococci	9				
Nahant	Black Rock	Weekly	Enterococci	11				
Nahant	Canoe	Weekly	Enterococci	11				

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Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Nahant	Nahant Beach (DCR - DUPR)	Weekly	Enterococci	12				
Nahant	Nahant Beach (DCR - DUPR)	Weekly	Enterococci	11	1	106	106	
Nahant	Nahant Beach (DCR - DUPR)	Weekly	Enterococci	12				
Nahant	Nahant Beach (DCR - DUPR)	Weekly	Enterococci	12				
Nahant	Short	Weekly	Enterococci	11				
Nahant	Tudor	Weekly	Enterococci	11				
Nantucket	40th Pole 1	Weekly	Enterococci	13	1	400	400	1
Nantucket	40th Pole 2	Weekly	Enterococci	10	1	120	120	1
Nantucket	Children's	Weekly	Enterococci	11				
Nantucket	Cisco	Weekly	Enterococci	10				
Nantucket	Cliffside	Weekly	Enterococci	10	1	172	172	1
Nantucket	Dionis	Weekly	Enterococci	11	1	146	146	1
Nantucket	Jettes	Weekly	Enterococci	10				
Nantucket	Madaket	Weekly	Enterococci	10				
Nantucket	Miacomet	Weekly	Enterococci	10				
Nantucket	Sconset 1	Weekly	Enterococci	10				
Nantucket	Sconset 2	Weekly	Enterococci	10				
Nantucket	Sewerbeds	Weekly	Enterococci	10				
Nantucket	Surfside 1	Weekly	Enterococci	10				
Nantucket	Surfside 2	Weekly	Enterococci	10				
Nantucket	Warren's Landing	Weekly	Enterococci	10				
Nantucket	Washing Pond	Weekly	Enterococci	11	1	400	400	1
Nantucket	Washington Street	Weekly	Enterococci	11	1	400	400	1
New Bedford	400 North	Weekly	Enterococci	13	2	126	304	2
New Bedford	400 South	Weekly	Enterococci	13	2	172	446	1
New Bedford	Davy's Locker	Weekly	Enterococci	13	2	232	834	1
New Bedford	J. Beach	Weekly	Enterococci	14	3	150	1000	5
New Bedford	Kids Beach	Weekly	Enterococci	13	2	404	830	1
New Bedford	O'Tools	Weekly	Enterococci	15	3	160	624	1
New Bedford	Squid	Weekly	Enterococci	13	2	704	7000	2
New Bedford	Tabor South	Weekly	Enterococci	17	3	118	756	2
New Bedford	Tower 1	Weekly	Enterococci	16	3	106	1000	2
New Bedford	Tower 4	Weekly	Enterococci	18	4	108	938	7
Newbury	Plum Island	Weekly	Enterococci	17				
Newburyport	Plum Island	Weekly	Enterococci	12				

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Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Newburyport	Plum Island	Weekly	Enterococci	11				
Newburyport	Plum Island	Weekly	Enterococci	11				
Newburyport	Plum Island	Weekly	Enterococci	9				
Oak Bluffs	Eastville Town Beach - Drawbridge	Weekly	Enterococci	21				
Oak Bluffs	Eastville Town Beach - Harbor	Weekly	Enterococci	22				
Oak Bluffs	Joseph Sylvia State Beach	Weekly	Enterococci	10				
Oak Bluffs	Joseph Sylvia State Beach	Weekly	Enterococci	10				
Oak Bluffs	Lagoon Pond Herring Run	Weekly	Enterococci	21				
Oak Bluffs	Marinelli (Jetty) Beach	Weekly	Enterococci	21				
Oak Bluffs	Pay Beach	Weekly	Enterococci	19				
Oak Bluffs	Sailing Camp Park	Weekly	Enterococci	21				
Orleans	Kent's	Weekly	Enterococci	13				
Orleans	Little Inn at Pleasant Bay	Weekly	Enterococci	12				
Orleans	Meeting House Pond	Weekly	Enterococci	14				
Orleans	Nauset	Weekly	Enterococci	14				
Orleans	Paw Wah Pond	Weekly	Enterococci	14	1	340	340	
Orleans	Pleasant Bay	Weekly	Enterococci	15	1	162	162	1
Orleans	Pricilla's Landing	Weekly	Enterococci	14	1	400	400	1
Orleans	Quanset Harbor Club Association	Weekly	Enterococci	12				
Orleans	Rock Harbor	Weekly	Enterococci	14	1	400	400	1
Orleans	Skacket	Weekly	Enterococci	16	2	128	146	2
Orleans	Town Cove	Weekly	Enterococci	14	1	400	400	1
Orleans	Skacket Beach Condos	Weekly	Enterococci	14				
Plymouth	Atlantic Street	Once	Enterococci	1				
Plymouth	Nelson Street	Weekly	Enterococci	10				
Plymouth	Plymouth	Weekly	Enterococci	14				
Plymouth	Plymouth	Weekly	Enterococci	14				
Plymouth	Plymouth	Weekly	Enterococci	14				
Plymouth	Stephen's Field	Weekly	Enterococci	10				
Plymouth	White Horse	Weekly	Enterococci	15				
Plymouth	White Horse	Weekly	Enterococci	14				
Provincetown	29 Commercial Street	Weekly	Enterococci	16	3	130	400	3
Provincetown	333 Commercial Street	Weekly	Enterococci	14	1	222	222	1

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Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Provincetown	451 Commerical Street	Weekly	Enterococci	14	1	400	400	1
Provincetown	593 Commercial Street	Weekly	Enterococci	15	3	174	400	2
Provincetown	637 Commercial Street	Weekly	Enterococci	15	3	134	400	2
Provincetown	Atkins Lane	Weekly	Enterococci	21	4	144	396	7
Provincetown	Atlantic Avenue	Weekly	Enterococci	13				
Provincetown	Court Street	Weekly	Enterococci	13				
Provincetown	Herring Cove	Weekly	Enterococci	24	1	114	114	1
Provincetown	Johnson Street	Weekly	Enterococci	15	1	324	324	1
Provincetown	Kendal Lane	Weekly	Enterococci	13				
Provincetown	Provincetown Inn	Weekly	Enterococci	14				
Provincetown	Race Point	Weekly	Enterococci	11				
Provincetown	Race Point	Weekly	Enterococci	26	1	114	114	
Provincetown	Race Point	Weekly	Enterococci	17				
Provincetown	Ryder Street	Weekly	Enterococci	19	3	120	212	6
Provincetown	Ryder Street	Weekly	Enterococci	15	1	114	114	1
Provincetown	Ryder Street	Weekly	Enterococci	15	1	188	188	1
Provincetown	Town Landing - Breakwater	Weekly	Enterococci	15	1	190	190	1
Provincetown	Town Landing - Snail Road	Weekly	Enterococci	16	2	166	400	2
Provincetown	Town Landing West of Coast Guard	Weekly	Enterococci	17	4	106	400	4
Provincetown	West End Lot	Weekly	Enterococci	14				
Quincy	Avalon	Weekly	Enterococci	13	1	980	980	1
Quincy	Broady (Baker)	Weekly	Enterococci	13	1	510	510	1
Quincy	Chikatawbot	Weekly	Enterococci	14	2	160	890	4
Quincy	Edgewater	Weekly	Enterococci	13	1	140	140	2
Quincy	Germantown Firestation	Weekly	Enterococci	13	1	450	450	1
Quincy	Heron	Weekly	Enterococci	13	1	400	400	1
Quincy	Merrymount	Weekly	Enterococci	12				
Quincy	Mound	Weekly	Enterococci	12				
Quincy	Nickerson	Weekly	Enterococci	12				
Quincy	Orchard Street	Weekly	Enterococci	12				
Quincy	Parkhurst	Weekly	Enterococci	13	1	640	640	1
Quincy	Rhoda	Weekly	Enterococci	16	3	187	380	3
Quincy	Wollaston (DCR - DUPR)	Daily	Enterococci	57	11	150	5000	6
Quincy	Wollaston (DCR - DUPR)	Daily	Enterococci	55	9	105	5000	6

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Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Quincy	Wollaston (DCR - DUPR)	Daily	Enterococci	57	4	105	5000	6
Quincy	Wollaston (DCR - DUPR)	Daily	Enterococci	57	11	110	750	6
Revere	Revere (DCR - DUPR)	Weekly	Enterococci	14	1	135	135	1
Revere	Revere (DCR - DUPR)	Weekly	Enterococci	14	2	141	385	1
Revere	Revere (DCR - DUPR)	Weekly	Enterococci	14	3	108	960	1
Revere	Revere (DCR - DUPR)	Weekly	Enterococci	13	1	119	119	1
Revere	Short (DCR - DUPR)	Weekly	Enterococci	13	1	540	540	
Rockport	Back	Weekly	Enterococci	13				
Rockport	Cape Hedge	Weekly	Enterococci	13				
Rockport	Front	Weekly	Enterococci	13				
Rockport	Long	Weekly	Enterococci	13				
Rockport	Long	Weekly	Enterococci	13				
Rockport	Old Garden	Weekly	Enterococci	13				
Rockport	Pebble	Weekly	Enterococci	12				
Salem	Back	Weekly	Enterococci	9	1	230	230	1
Salem	Collins Cove	Weekly	Enterococci	13				
Salem	Dead Horse	Weekly	Enterococci	13				
Salem	Dock	Weekly	Enterococci	9	1	142	142	
Salem	Forest River Point	Weekly	Enterococci	13				
Salem	Juniper Point	Weekly	Enterococci	13				
Salem	Mackey	Weekly	Enterococci	13				
Salem	Naumkeag	Weekly	Enterococci	13				
Salem	Ocean Avenue	Weekly	Enterococci	13	1	1100	1100	1
Salem	Osgood	Weekly	Enterococci	13				
Salem	Pickman	Weekly	Enterococci	14	2	190	210	2
Salem	Pioneer	Weekly	Enterococci	13	1	320	320	
Salem	Steps	Weekly	Enterococci	13				
Salem	Tractor	Weekly	Enterococci	8	1	180	180	
Salem	Wally	Weekly	Enterococci	9	1	170	170	
Salem	Willow Avenue	Weekly	Enterococci	15	5	133	490	7
Salem	Willows Pier	Weekly	Enterococci	13				
Salem	Winter Island (Waikiki)	Weekly	Enterococci	13				
Salisbury	Salisbury (DCR - DSPR)	Weekly	Enterococci	14				
Sandwich	East Sandwich	Weekly	Enterococci	13				
Sandwich	Scusset (DCR - DSPR)	Weekly	Enterococci	12				

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Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Sandwich	Torrey Beach Community Association	Weekly	Enterococci	12	1	110	110	
Sandwich	Town Neck (Boardwalk)	Weekly	Enterococci	13				
Sandwich	Town Neck (Horizons)	Weekly	Enterococci	13				
Scituate	Egypt	Weekly	Enterococci	11				
Scituate	Humarock	Weekly	Enterococci	11				
Scituate	Minot	Weekly	Enterococci	11				
Scituate	Peggotty	Weekly	Enterococci	11				
Scituate	Sand Hills	Weekly	Enterococci	11				
Somerset	Pearse	Weekly	Enterococci	16	3	136	158	3
Swampscott	Eisman's	Weekly	Enterococci	12				
Swampscott	Fisherman's	Weekly	Enterococci	12				1
Swampscott	Kings North	Weekly	Enterococci	12				
Swampscott	Phillips	Weekly	Enterococci	11				
Swampscott	Preston	Weekly	Enterococci	11				
Swampscott	Stacey	Weekly	Enterococci	12				
Swampscott	Whales	Weekly	Enterococci	11				
Swansea	Cedar Cove	Twice	Enterococci	2				
Swansea	Coles River Club off Harbor Rd	Twice	Enterococci	2				
Swansea	Sandy Beach	Weekly	Enterococci	13				
Swansea	Town Beach	Weekly	Enterococci	13				
Tisbury	Hilman's Point	Weekly	Enterococci	8				
Tisbury	Lake Street	Weekly	Enterococci	10				
Tisbury	Owen Little Way	Weekly	Enterococci	10				
Tisbury	Owen Park	Weekly	Enterococci	10				
Tisbury	Sound @ Wilfred's Pond Reserve	Weekly	Enterococci	10				
Tisbury	Tashmoo Beach	Weekly	Enterococci	10				
Tisbury	Tashmoo Cut	Weekly	Enterococci	10				
Tisbury	Vineyard Harbor Motel	Weekly	Enterococci	10				
Truro	379 Shore Road	Weekly	Enterococci	13				
Truro	496 Shore Road	Weekly	Enterococci	15				
Truro	648 Shore Road	Weekly	Enterococci	14				
Truro	Ballston	Weekly	Enterococci	13				
Truro	Coast Guard Town	Weekly	Enterococci	14	1	136	136	

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Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Truro	Cold Storage/Pond Village	Weekly	Enterococci	13				
Truro	Corn Hill	Weekly	Enterococci	14	1	145	145	
Truro	Fisher	Weekly	Enterococci	13				
Truro	Great Hollow	Weekly	Enterococci	14				
Truro	Head of the Meadow (National)	Weekly	Enterococci	11				
Truro	Head of the Meadow (Town)	Weekly	Enterococci	15	2	292	400	
Truro	Long Nook	Weekly	Enterococci	13				
Truro	Noon's Landing	Weekly	Enterococci	14				
Truro	Pamet Harbor	Weekly	Enterococci	14	1	110	110	
Truro	Ryder	Weekly	Enterococci	13				
Truro	Town Landing Beach Point	Weekly	Enterococci	15	1	120	120	1
Wareham	Briarwood	Weekly	Enterococci	12				
Wareham	East Boulevard	Weekly	Enterococci	13	1	148	148	1
Wareham	Little Harbor	Weekly	Enterococci	13	1	360	360	1
Wareham	North Boulevard	Weekly	Enterococci	13	1	400	400	1
Wareham	Onset	Weekly	Enterococci	12				
Wareham	Parkwood	Weekly	Enterococci	13	1	400	400	1
Wareham	Pinehurst	Weekly	Enterococci	12				
Wareham	Point Independence	Weekly	Enterococci	13	1	162	162	1
Wareham	Riverside Avenue	Weekly	Enterococci	13	1	143	143	1
Wareham	Shell Point	Weekly	Enterococci	12				
Wareham	Swift's	Weekly	Enterococci	13	1	118	118	1
Wareham	Swift's Neck	Weekly	Enterococci	12				
Wellfleet	Burton Baker	Weekly	Enterococci	13				
Wellfleet	Cahoon Hollow	Weekly	Enterococci	14	1	170	170	
Wellfleet	Chequesset Yacht and Country Club	Weekly	Enterococci	12				
Wellfleet	Duck Harbor	Weekly	Enterococci	13				
Wellfleet	Indian Neck	Weekly	Enterococci	13				
Wellfleet	Kellers Corner	Weekly	Enterococci	13				
Wellfleet	Maguires Landing	Weekly	Enterococci	14	1	400	400	
Wellfleet	Marconi	Weekly	Enterococci	11				
Wellfleet	Marconi	Weekly	Enterococci	10				
Wellfleet	Marconi	Weekly	Enterococci	11				

Table 17

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Wellfleet	Mayo	Weekly	Enterococci	14	1	400	400	
Wellfleet	Newcomb Hollow	Weekly	Enterococci	14	1	384	384	
Wellfleet	Omaha Road	Weekly	Enterococci	13				
Wellfleet	Powers	Weekly	Enterococci	13				
Wellfleet	White Crest	Weekly	Enterococci	13				
West Tisbury	Great Pond @ Long Point	Weekly	Enterococci	11				
West Tisbury	Lambert's Cove Beach	Weekly	Enterococci	17				
West Tisbury	Lambert's Cove Beach	Weekly	Enterococci	17				
West Tisbury	Ocean @ Long Point	Weekly	Enterococci	23				
West Tisbury	Ocean @ Long Point	Weekly	Enterococci	7				
West Tisbury	Sepiessa Point	Weekly	Enterococci	17				
Westport	Baker's Beach	Once	Enterococci	1				
Westport	C & K Club	Once	Enterococci	1				
Westport	Cherry & Webb	Weekly	Enterococci	17				
Westport	East Beach	Weekly	Enterococci	18	1	366	366	
Westport	Elephant	Once	Enterococci	1				
Westport	Horseneck (DCR - DSPR)	Weekly	Enterococci	15				
Westport	Howland	Once	Enterococci	1				
Westport	Spindle Rock	Once	Enterococci	1				
Westport	Town Beach	Weekly	Enterococci	16				
Westport	Yacht Club	Once	Enterococci	1				
Weymouth	Lane (New Wessagussett)	Weekly	Enterococci	13				
Weymouth	Wessagusett (Old Wessagussett)	Weekly	Enterococci	13				
Winthrop	Donovans	Unknown	Enterococci	7				
Winthrop	Grandview	Unknown	Enterococci	7				
Winthrop	Halford	Unknown	Enterococci	7				
Winthrop	Pico	Unknown	Enterococci	7				
Winthrop	Winthrop (DCR - DUPR)	Weekly	Enterococci	12				
Winthrop	Yerrill	Unknown	Enterococci	7	1	110	110	
Yarmouth	Bass River	Weekly	Enterococci	15				
Yarmouth	Bass River	Weekly	Enterococci	12				
Yarmouth	Baxter Avenue	Weekly	Enterococci	13				
Yarmouth	Bay Road	Weekly	Enterococci	13				
Yarmouth	Bayview Street	Weekly	Enterococci	13				

Table 17

Water quality data for marine public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Yarmouth	Colonial Acres	Weekly	Enterococci	17	1	268	268	
Yarmouth	Columbus Avenue	Weekly	Enterococci	13				
Yarmouth	Englewood	Weekly	Enterococci	13				
Yarmouth	Follins Pond	Weekly	Enterococci	15	2	142	254	
Yarmouth	Gray's Beach	Weekly	Enterococci	13				
Yarmouth	Parkers River East	Weekly	Enterococci	13				
Yarmouth	Parkers River West	Weekly	Enterococci	13				
Yarmouth	Seagull (Center)	Weekly	Enterococci	13				
Yarmouth	Seagull (Left)	Weekly	Enterococci	14				
Yarmouth	Seagull (Right)	Weekly	Enterococci	15	1	230	230	1
Yarmouth	Seaview	Weekly	Enterococci	13				
Yarmouth	South Middle	Weekly	Enterococci	13				
Yarmouth	Thatcher Town Park	Weekly	Enterococci	13				
Yarmouth	Wilbur Park	Weekly	Enterococci	13				
Yarmouth	Windmill	Weekly	Enterococci	13				

1 - Multiple instances of beaches may occur due to multiple sampling points.

2 - The number of postings could be greater than the number of single sample exceedances due to the presence of geometric mean exceedances.

Table 18

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Abington	Island Grove Beach	Weekly	E. Coli	1				
Abington	Island Grove Beach	Weekly	Enterococci	10				
Acton	Nara Beach	Weekly	E. Coli	20	2	290	600	2
Agawam	Robinson Pond Beach 1	Weekly	Enterococci	16	1	122	122	
Amesbury	Camp Bauercrest	Weekly	E. Coli	6				
Amesbury	Glen Devin Condominiums	Weekly	E. Coli	6	1	560	560	
Amesbury	Lake Attitash-Dam/Bathing area	Weekly	E. Coli	5				
Amesbury	Lake Gardner-Greatest batherload	Weekly	E. Coli	8	2	270	550	
Amesbury	Whitehall Lake Conominiums-Crowninshield Mgmt.	Weekly	E. Coli	6				
Andover	Pomps Pond - Left Side	Weekly	E. Coli	11				
Andover	Pomps Pond - Right Side	Weekly	E. Coli	11				
Arlington	Arlington Reservoir	Weekly	E. Coli	10				
Ashburnham	Camp Collier	Twice per month	E. Coli	6	1	600	600	
Ashburnham	Camp Howe Beach	Weekly	E. Coli	7				
Ashburnham	Camp Split Rock	Weekly	E. Coli	8				
Ashburnham	Camp Winnekeag Pond	Weekly	E. Coli	10	1	310	310	1
Ashby	Camp Middlesex	Weekly	E. Coli	6				
Ashby	Damon Pond Beach	Weekly	Enterococci	14	1	78	78	1
Ashfield	Ashfield Lake Beach	Weekly	E. Coli	16				
Ashland	Ashland Reservoir-Main Beach	Weekly	Enterococci	17	3	64	148	2
Athol	Ellis Beach	Weekly	E. Coli	16				
Athol	Silver Lake	Weekly	E. Coli	16				
Auburn	Century Sportsmen	Weekly	E. Coli	16				
Ayer	Ayer Town Beach	Weekly	E. Coli	10	1	600	600	1
Ayer	Mirror Lake	Weekly	E. Coli	11				
Barnstable	Bearses Pond	Weekly	E. Coli	14				
Barnstable	Garrett's Pond	Weekly	E. Coli	15	2	280	380	2
Barnstable	Gooseberry Pond	Weekly	E. Coli	13				
Barnstable	Hamblin Pond	Weekly	E. Coli	14				
Barnstable	Hathaway Pond	Weekly	E. Coli	14				
Barnstable	Joshua's Pond	Weekly	E. Coli	14	1	270	270	1
Barnstable	Long Pond	Weekly	E. Coli	13				
Barnstable	Long Pond Farms Association	Weekly	E. Coli	12				

Table 18

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Barnstable	Lovell's Pond	Weekly	E. Coli	13				
Barnstable	Middle Pond	Weekly	E. Coli	13				
Barnstable	Mystic Lake Race Lane	Weekly	E. Coli	13				
Barnstable	Mystic Lake Sawmill	Weekly	E. Coli	13				
Barnstable	Sand Shores Association	Weekly	E. Coli	12				
Barnstable	Shallow Pond	Weekly	E. Coli	13				
Barnstable	Shubael Pond	Weekly	E. Coli	13				
Barnstable	Wequaquet Lake Town	Weekly	E. Coli	14				
Barnstable	Wequaquet Lake Yacht	Weekly	E. Coli	13				
Barnstable	Wianno Club (Fresh-Crystal Lake)	Weekly	E. Coli	12				
Becket	Becket Woods Beach	Weekly	E. Coli	16				
Becket	Becket Woods Dock	Weekly	E. Coli	16				
Becket	Camp Becket Main Beach	Weekly	E. Coli	16				
Becket	Camp Greylock Jr. Beach	Weekly	E. Coli	10				
Becket	Camp Greylock Sr. Beach	Weekly	E. Coli	11				
Becket	Camp Watitoh Beach	Weekly	E. Coli	10				
Becket	Center Pond Assn. Beach	Weekly	E. Coli	15				
Becket	Center Pond Beach	Weekly	E. Coli	15				
Becket	Chimney Corners Beach	Weekly	E. Coli	16				
Becket	Crystal Pond Beach	Weekly	E. Coli	15				
Becket	Excalibur	Weekly	E. Coli	15				
Becket	Indian Lake	Weekly	E. Coli	16				
Becket	Indian Lake Large Beach	Weekly	E. Coli	16				
Becket	Indian Lake Small Beach	Weekly	E. Coli	16				
Becket	Indian Lake Small Pond Beach	Weekly	E. Coli	16				
Becket	Lancelot Beach	Weekly	E. Coli	17				
Becket	Little Robin Beach	Weekly	E. Coli	17				
Becket	Mt. Grove Beach	Weekly	E. Coli	16				
Becket	Robin Hood #1	Weekly	E. Coli	18				
Becket	Robin Hood #2	Weekly	E. Coli	16				
Becket	Shawnee Shore Beach	Weekly	E. Coli	16				
Bedford	Springs Brook Park Bathing Beach	Weekly	E. Coli	1				
Bedford	Springs Brook Park Bathing Beach	Weekly	E. Coli	12				
Bedford	Springs Brook Park Bathing Beach	Weekly	E. Coli	11				
Belchertown	Lake Arcadia	Weekly	E. Coli	10				

Table 18

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Bellingham	Arcand Park	Twice	E. Coli	2				
Bellingham	Silver Lake	Weekly	E. Coli	12	1	410	410	
Billerica	Nutting Lake - Micozzi Beach	Weekly	E. Coli	12	1	450	450	
Billerica	Nutting Lake - Micozzi Beach	Weekly	E. Coli	11	1	600	600	
Bolton	Bolton Town Beach	Weekly	E. Coli	10				
Bolton	Camp Virginia Beach	Weekly	E. Coli	8				
Bolton	Tom Denny Camp	Weekly	E. Coli	7				
Boston	Unknown Fresh Beach	Three times	E. Coli	3				
Bourne	Picture Lake	Weekly	E. Coli	13				
Bourne	Queen Sewell Pond	Weekly	E. Coli	13				
Boxford	Stiles Pond - Greatest Batherload	Weekly	E. Coli	15				
Braintree	Sunset Lake	Weekly	E. Coli	14	1	292	292	1
Brewster	Beechwood	Weekly	E. Coli	10				
Brewster	Blueberry Pond	Weekly	E. Coli	12				
Brewster	Cape Cod Sea Camps Long Pond	Weekly	E. Coli	12				
Brewster	Cliff Pond	Weekly	Enterococci	15				
Brewster	Flax Pond	Weekly	Enterococci	15				
Brewster	Greenland Pond	Weekly	E. Coli	10				
Brewster	Little Cliff Pond	Weekly	Enterococci	15				
Brewster	Long Pond	Weekly	E. Coli	12				
Brewster	Long Pond at Camp Favorite	Weekly	E. Coli	12				
Brewster	Owl Pond	Weekly	E. Coli	12				
Brewster	Seymore Pond	Weekly	E. Coli	12				
Brewster	Sheep Pond	Weekly	E. Coli	12				
Brewster	Sheep Pong Beach (Tupelo Rd)	Weekly	E. Coli	12				
Brewster	Slough Pond	Weekly	E. Coli	12				
Brewster	Upper Mill Pond	Weekly	E. Coli	12				
Brimfield	Dean Pond Beach	Weekly	Enterococci	14				
Brimfield	East Brimfield Resevoir	Weekly	Enterococci	15				
Brookfield	South Pond	Weekly	E. Coli	7				
Carver	Cooper's Pond	Monthly	E. Coli	6				
Carver	Crystal Lake	Monthly	E. Coli	6				
Carver	John's Pond	Monthly	E. Coli	6				
Carver	Sampson's Pond	Monthly	E. Coli	6				
Charlemont	Cold River Pool	Weekly	Enterococci	17	3	100	200	3

Table 18

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Charlton	Camp Foskett	Weekly	E. Coli	10				
Charlton	Camp Joslin	Unknown	E. Coli	7				
Charlton	Little Nugget	Weekly	E. Coli	8	1	800	800	
Charlton	Pridle Beach	Weekly	E. Coli	8				
Chatham	Goose Pond	Weekly	Enterococci	13				
Chatham	Pilgrim Village	Weekly	Enterococci	12				
Chatham	Schoolhouse Pond	Weekly	E. Coli	1				
Chatham	Schoolhouse Pond	Weekly	Enterococci	12				
Chatham	White Pond	Weekly	E. Coli	1				
Chatham	White Pond	Weekly	Enterococci	13				
Chelmsford	Baptist Pond	Weekly	E. Coli	11	1	400	400	1
Chelmsford	Baptist Pond	Weekly	E. Coli	11	1	300	300	
Chelmsford	Freeman Lake	Weekly	E. Coli	10				
Chelmsford	Freeman Lake	Weekly	E. Coli	10				
Chesterfield	Chesterfield Scout Reservation - BSA	Weekly	E. Coli	12				
Chicopee	Chicopee Beach	Weekly	Enterococci	15	2	74	84	2
Clarksburg	Mausert Pond - Day use area beach	Weekly	Enterococci	15	2	126	600	2
Concord	Annursnac Hill Assoc.	Weekly	E. Coli	15				
Concord	Kennedy Pond	Weekly	E. Coli	15				
Concord	Silver Hill Assoc	Weekly	E. Coli	17	2	312	640	1
Concord	Walden Pond - Main	Weekly	E. Coli	22	3	252	648	3
Concord	Walden Pond - Main	Weekly	Enterococci	21	1	234	234	1
Concord	Walden Pond - Red Cross	Weekly	E. Coli	18				
Concord	Walden Pond - Red Cross	Weekly	Enterococci	18				
Concord	White Pond - SW Cove	Weekly	E. Coli	15				
Concord	White Pond Assoc	Weekly	E. Coli	15				
Conway	Conway Swimming Pool	Weekly	E. Coli	13				
Cummington	Shire Village Beach	Weekly	E. Coli	9				
Dennis	Flax Pond	Weekly	E. Coli	13				
Dennis	Princess Beach-Scargo Lake	Weekly	E. Coli	13				
Dennis	Scargo Lake	Weekly	E. Coli	13				
Douglas	Breezy Picnic Grounds	Weekly	E. Coli	15				
Douglas	Lake Manchaug Camping	Weekly	E. Coli	15				
Douglas	Wallum Lake Terrace	Weekly	E. Coli	15				

Table 18

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Douglas	Wallum Lake Terrace	Weekly	Enterococci	16	1	112	112	1
Dracut	Fleur de Lis	Weekly	E. Coli	10	2	350	350	
Dracut	Grove	Weekly	E. Coli	8				
Dracut	Hilltop	Weekly	E. Coli	8				
Dracut	Mascuppic	Weekly	E. Coli	10	2	240	1400	
Dracut	Passaconaway	Weekly	E. Coli	8				
Dracut	Peter's Pond	Weekly	E. Coli	9	1	430	430	
Dracut	Richardson	Weekly	E. Coli	8				
Dudley	Merino Pond	Weekly	E. Coli	7				
East Brookfield	Lake Lashaway	Weekly	E. Coli	12	1	400	400	
Eastham	Great Pond	Weekly	E. Coli	14				
Eastham	Herring Pond	Weekly	E. Coli	13				
Eastham	Long Pond	Weekly	E. Coli	13				
Eastham	Minister's Pond	Weekly	E. Coli	14	1	328	328	1
Eastham	Nauset Haven Lakeside Condo (Minister)	Weekly	E. Coli	12				
Eastham	Whispering Pines Condo (Muddy Pond)	Weekly	E. Coli	12				
Eastham	Wiley Park	Weekly	E. Coli	14				
Easton	Swim area	Weekly	E. Coli	13				
Egremont	Prospect Lake Park	Weekly	E. Coli	15				
Egremont	Town Beach	Weekly	E. Coli	12				
Erving	Laurel Lake	Weekly	Enterococci	15				
Essex	Camp Menorah	Weekly	E. Coli	11	3	340	560	2
Essex	Centennial Grove	Weekly	E. Coli	19	4	360	460	2
Falmouth	229 Lakeshore - Pinecrest	Unknown	E. Coli	4				
Falmouth	Ashumet Pond Holly Sands	Weekly	E. Coli	14	1	390	390	1
Falmouth	Ashumet Valley POA/Holly Sands	Weekly	E. Coli	12				
Falmouth	Cape Cod Camp Resort	Weekly	E. Coli	12				
Falmouth	Coonamessett Pond	Weekly	E. Coli	13				
Falmouth	Grew's Pond	Weekly	E. Coli	13				
Falmouth	Jenkins Pond - Pinecrest	Weekly	E. Coli	12				
Falmouth	Lochstead Association	Weekly	E. Coli	12				
Falmouth	Mares Pond Association	Weekly	E. Coli	12				
Falmouth	Sand Point Shores-Rock Hollow	Weekly	E. Coli	12				

Table 18

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Falmouth	Sand Point Shores-White Cap	Weekly	E. Coli	12				
Falmouth	Shady Lane HA-Crooked Pond	Weekly	E. Coli	12				
Falmouth	Water-by Estates Association-Flax Pond	Weekly	E. Coli	12				
Florida	Manice Education Center Beach	Weekly	E. Coli	14				
Framingham	Cochituate Beach	Weekly	E. Coli	9				
Framingham	Leanney Beach	Weekly	E. Coli	9				
Framingham	Washakum Beach	Weekly	E. Coli	10	1	600	600	
Freetown	Town Beach	Weekly	E. Coli	17	3	310	640	
Gardner	Dunn Pond	Weekly	Enterococci	15				
Georgetown	American Legion Park	Weekly	E. Coli	14	4	260	840	
Georgetown	Camp Leslie	Weekly	E. Coli	8				
Goshen	Camp Howe	Weekly	E. Coli	11				
Goshen	Hammond Acres	Weekly	E. Coli	16				
Goshen	Upper Highland Lake - Campers Beach	Weekly	E. Coli	3				
Goshen	Upper Highland Lake - Campers Beach	Weekly	Enterococci	17	1	114	114	1
Goshen	Upper Highland Lake - Day use area beach	Weekly	Enterococci	16				
Grafton	Silver Lake Beach	Weekly	E. Coli	10				
Great Barrington	Green River	Weekly	E. Coli	9	2	280	770	
Great Barrington	Lake Mansfield	Weekly	E. Coli	9				
Greenfield	Greenfield Municipal Bathing Beach	Weekly	E. Coli	16	1	245	245	
Groton	Baby Beach Lost Lake	Weekly	E. Coli	11				
Groton	Groton Town Beach	Weekly	E. Coli	13	1	600	600	1
Groton	Grotonwood Camp	Weekly	E. Coli	10				
Halifax	19 Lake Street	Weekly	E. Coli	12	1	277	277	
Halifax	93 Lake Street	Once	E. Coli	1				
Halifax	Annawon Street	Weekly	E. Coli	11				
Halifax	Cooke's Beach	Weekly	E. Coli	12				
Halifax	Halifax Beach	Weekly	E. Coli	10				
Halifax	Holmes Street	Weekly	E. Coli	12				
Halifax	Lingan Street	Weekly	E. Coli	12	1	380	380	
Halifax	Wamsutta	Weekly	E. Coli	12				

Table 18

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Hanson	Arlene	Weekly	E. Coli	7				
Hanson	Camp Kiwanee	Three times	E. Coli	3				
Hanson	Cranberry	Unknown	E. Coli	6				
Hanson	Ocean Ave.	Weekly	E. Coli	7	1	290	290	
Hanson	Wilkey's	Weekly	E. Coli	7				
Harvard	Harvard Town Beach	Weekly	E. Coli	12	2	600	600	1
Harwich	Aunt Edie's Pond	Weekly	E. Coli	12				
Harwich	Buck's Pond	Weekly	E. Coli	13				
Harwich	Great Sands - Buck's Pond	Weekly	E. Coli	12				
Harwich	Hinckley's Pond	Weekly	E. Coli	13				
Harwich	Joseph's Pond Lakeside	Weekly	E. Coli	12				
Harwich	Joseph's Pond Vacation	Weekly	E. Coli	12				
Harwich	Long Pond Rte 124	Weekly	E. Coli	13				
Harwich	Long Pond-Calhoun	Weekly	E. Coli	14				
Harwich	Long Pond-Long Pond Drive	Weekly	E. Coli	14				
Harwich	Robbins Pond	Weekly	E. Coli	13				
Harwich	Sand Pond	Weekly	E. Coli	14				
Harwich	Seymore Pond	Weekly	E. Coli	14				
Harwich	Skinequit Pond	Weekly	E. Coli	13				
Haverhill	Plug's Pond	Weekly	E. Coli	11				
Hinsdale	Camp Asmere Beach	Weekly	E. Coli	15				
Hinsdale	Camp Emerson Beach	Weekly	E. Coli	9				
Hinsdale	Camp Emerson Marina	Weekly	E. Coli	9				
Hinsdale	Camp Romaca	Monthly	E. Coli	4				
Hinsdale	Camp Romaca	Monthly	E. Coli	4				
Hinsdale	Camp Taconic Beach	Weekly	E. Coli	12				
Hinsdale	Dan Duquette Sports Academy	Weekly	E. Coli	16				
Hinsdale	Plunkett Lake Beach	Weekly	E. Coli	16				
Holden	Eagle Lake	Twice per month	E. Coli	6				
Holliston	Pleasure Point	Weekly	E. Coli	12				
Holliston	Stoddard	Weekly	E. Coli	12				
Hopkinton	Hopkinton Resevoir-Main Beach	Weekly	Enterococci	16	1	192	192	1
Hopkinton	Hopkinton Resevoir-Upper Beach	Weekly	Enterococci	16				
Hopkinton	Sandy Beach	Weekly	E. Coli	12				

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Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Hopkinton	Sandy Beach	Weekly	E. Coli	12				
Hopkinton	Sandy Beach	Weekly	E. Coli	12				
Hubbardston	Comet Pond Beach	Weekly	E. Coli	8				
Hubbardston	Comet Pond Beach	Weekly	E. Coli	8				
Hubbardston	Comet Pond Beach	Weekly	E. Coli	8				
Hudson	Hudson Centennial Beach	Weekly	E. Coli	13	1	800	800	1
Huntington	Camp Sandy Brook	Weekly	E. Coli	9				
Huntington	Westfield River Beach	Weekly	Enterococci	19	9	84	600	1
Ipswich	Hood Pond-boat ramp	Weekly	E. Coli	14				
Lakeville	Big Beach	Weekly	E. Coli	15				
Lakeville	Bliss Road	Weekly	E. Coli	8				1
Lakeville	Clark Shores 3	Weekly	E. Coli	15	1	1400	1400	1
Lakeville	Clear Pond	Weekly	E. Coli	10				
Lakeville	Heaven Heights	Weekly	E. Coli	14				
Lakeville	Loon Pond	Three times	E. Coli	3				
Lakeville	Pilgrim Road	Weekly	E. Coli	9	1	410	410	2
Lancaster	Camp Lowe Beach	Weekly	E. Coli	9				
Lancaster	Lancaster Town Beach	Weekly	E. Coli	8				
Lanesborough	Camp Mohawk Beach	Weekly	E. Coli	10				
Lanesborough	Sunrise Beach	Weekly	E. Coli	13				
Lee	Goose Pond	Weekly	E. Coli	12				
Lee	Laurel Lake	Weekly	E. Coli	12				
Lee	Sandy Beach	Weekly	E. Coli	11				
Lenox	Laurel Lake	Weekly	E. Coli	12				
Leominster	Pierce Pond Dam	Weekly	E. Coli	15				
Leominster	Ricker's Kindercamp	Twice	Not Indicated	2				
Leverett	Ruggles Pond	Weekly	Enterococci	15				
Lexington	Old Reservoir Swim Area Left #1	Weekly	Enterococci	8				
Lexington	Old Reservoir Swim Area Left #2	Weekly	Enterococci	13	1	94	94	
Lexington	Old Reservoir Swim Area Right #1	Weekly	Enterococci	18				
Lexington	Old Reservoir Swim Area Right #2	Weekly	Enterococci	16				
Littleton	Littleton Town Beach	Weekly	E. Coli	12				
Lowell	Merrimac River - Boat House	Weekly	E. Coli	7				
Ludlow	Haviland Pond	Weekly	E. Coli	17	4	250	4000	

Table 18

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Ludlow	Haviland Pond	Weekly	E. Coli	16				
Lunenburg	Lunenburg Town Beach	Weekly	E. Coli	9				
Lynn	Flax Pond - Railing	Weekly	E. Coli	5	3	610	5300	
Lynn	Flax Pond - Rocks	Weekly	E. Coli	5	5	270	2390	
Lynn	Sluice Pond - Briarcliff Lodge	Weekly	E. Coli	5	3	290	550	
Lynn	Sluice Pond - Four Winds	Weekly	E. Coli	5	2	340	370	
Marlborough	Boat Ramp	Weekly	Total Coliform	8				
Marlborough	Cullinane	Once	Total Coliform	1				
Marlborough	Grove	Weekly	Total Coliform	8				
Marlborough	McDonald Beach	Weekly	Total Coliform	8				
Marlborough	Memorial - Left	Weekly	E. Coli	9				
Marlborough	Memorial - Middle	Weekly	E. Coli	9				
Marlborough	Memorial - Right	Weekly	E. Coli	9				
Marlborough	Rodger's Beach	Weekly	Total Coliform	8				
Mashpee	Attaquin	Weekly	E. Coli	13	1	404	404	1
Mashpee	Camp Farley - Wakeby Pond	Weekly	E. Coli	12				
Mashpee	Fells Pond	Weekly	E. Coli	12				
Mashpee	John's Pond (Briarwood)	Weekly	E. Coli	12				
Mashpee	John's Pond (North)	Weekly	E. Coli	13				
Mashpee	John's Pond (Public)	Weekly	E. Coli	13	1	244	244	1
Mashpee	John's Pond Estate Assoc. - Sunset Beach	Weekly	E. Coli	11				
Mashpee	Mashpee Shores Assoc.	Weekly	E. Coli	12				
Mashpee	Santuit Pond	Weekly	E. Coli	13	1	356	356	1
Mashpee	Santuit Pond Estate Assoc. - Santuit Pond	Weekly	E. Coli	18				
Mashpee	Trustee's of the Reservation (Mashpee Pond)	Weekly	E. Coli	12				
Mashpee	Trustee's of the Reservation (Wakeby Pond)	Weekly	E. Coli	12				
Medfield	Hinkley	Weekly	E. Coli	8				
Medfield	Hinkley	Weekly	Enterococci	1				
Medford	DCR - Sandy Beach @ Upper Mystic	Weekly	Enterococci	20	3	79	485	
Medford	Medford Boat Club	Once	E. Coli	1				

Table 18

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Medford	Medford Boat Club	Once	E. Coli	1				
Medford	Wrights Pond - Deep End	Weekly	E. Coli	12				
Medford	Wrights Pond - Shallow End	Weekly	E. Coli	12				
Medway	Choate Pond	Weekly	E. Coli	9	2	400	430	2
Medway	Choate Pond	Weekly	E. Coli	12	2	250	500	
Mendon	Town Beach	Weekly	E. Coli	11				
Merrimac	Lake Attitash	Weekly	E. Coli	9				
Methuen	Forest Lake - Center	Weekly	E. Coli	15				
Methuen	Forest Lake - North Ramp	Weekly	E. Coli	14	1	276	276	
Methuen	Forest Lake - Right	Weekly	E. Coli	15				
Methuen	Forest Lake - South Ramp	Weekly	E. Coli	17	1	1987	1987	
Middleborough	Camp Avoda	Weekly	E. Coli	8				
Middleborough	Camp Yomechas	Weekly	E. Coli	19	1	800	800	1
Middleborough	Woods Pond Cabins	Weekly	E. Coli	8				
Middleton	Thunderbridge	weekly	E. Coli	14	1	370	370	
Milton	DCR - Houghton's Pond @ Bathhouse	Weekly	Enterococci	15				
Monterey	Benedict Pond Beach	Weekly	Enterococci	16	2	72	120	2
Monterey	Camp Half Moon	Weekly	E. Coli	10				
Monterey	Lake Garfield	Weekly	E. Coli	16				
Monterey	The Seven Stones Beach	Weekly	E. Coli	17				
Mt. Washington	Camp Hi Rock - Bear Rock Beach	Weekly	E. Coli	13				
Mt. Washington	Camp Hi Rock - Main Beach	Weekly	E. Coli	16				
Nantucket	Miacomet Pond	Weekly	E. Coli	23	9	256	512	1
Nantucket	Sesachacha Pond	Weekly	E. Coli	10				
Natick	Camp Arrowhead	Weekly	E. Coli	11				
Natick	Camp Nonesuch	Weekly	E. Coli	6	1	420	420	
Natick	Cochituate Lake-North Beach	Weekly	Enterococci	19	3	100	160	2
Natick	Cochituate Lake-South Beach	Weekly	Enterococci	15				
Natick	Dug Pond - Diving	Weekly	E. Coli	12				
Natick	Dug Pond - Kiddie	Weekly	E. Coli	12				
New Marlborough	Camp Segowea	Weekly	E. Coli	12				
Newton	Crystal Lake	Weekly	E. Coli	7	1	1030	1030	
North Adams	Windsor Lake	Twice per month	E. Coli	7				

Table 18

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
North Andover	Berry Pond Beach	Weekly	Enterococci	16				
North Andover	Frye Pond Beach	Weekly	Enterococci	13	1	66	66	1
North Andover	Stevens Pond - Left	Once	E. Coli	1				
North Andover	Stevens Pond - Right	Weekly	E. Coli	11				
North Attleborough	Falls Pond	Weekly	E. Coli	9				
North Attleborough	Whitings Pond	Weekly	E. Coli	23	6	240	670	1
North Brookfield	Brooks Pond	Weekly	E. Coli	11				
North Brookfield	Camp Atwater	Weekly	E. Coli	8				
Northampton	Musante Beach	Weekly	E. Coli	12				
Northbridge	Hickory Hill - Girl Scouts	Weekly	E. Coli	10				
Northbridge	Memorial Beach	Weekly	E. Coli	9				
Norton	Wading River	Weekly	E. Coli	9	7	250	880	
Oakham	Lake Dean - Dean Campground	Weekly	E. Coli	14				
Oakham	Lake Dean - Pine Acres Campground	Weekly	E. Coli	14				
Orange	Matawa Beach	Weekly	E. Coli	8				
Orleans	Baker's Pond	Weekly	E. Coli	15	1	240	240	1
Orleans	Crystal Lake	Weekly	E. Coli	14				
Orleans	Pilgrim Lake	Weekly	E. Coli	15	1	792	792	1
Otis	Camp Bonnie Brae	Weekly	E. Coli	10				
Otis	Camp Nawaka	Weekly	E. Coli	10				
Otis	Camp Overflow Beach	Weekly	E. Coli	16				
Otis	Otis Reservoir Beach	Weekly	Enterococci	16	1	600	600	1
Otis	Otis Woodlands	Weekly	E. Coli	17				
Otis	Otis Woodlands	Weekly	E. Coli	17				
Otis	Otis Woodlands	Weekly	E. Coli	17				
Oxford	Barton Pond	Weekly	E. Coli	5				
Oxford	Carbunkle Pond	Weekly	E. Coli	18	2	490	800	
Pembroke	Chester	Once	E. Coli	1				
Pembroke	Douglass	Once	E. Coli	1				
Pembroke	Finn Camp	Weekly	E. Coli	12				
Pembroke	Furnace Colony	Weekly	E. Coli	12	1	660	660	
Pembroke	Hobomoc Pond	Weekly	E. Coli	13				
Pembroke	Lally	Once	E. Coli	1				
Pembroke	Little Sandy	Weekly	E. Coli	13				
Pembroke	Millpond	Once	E. Coli	1				

Table 18

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Pembroke	Oldham	Weekly	E. Coli	16	3	292	870	1
Pembroke	Stetson	Weekly	E. Coli	14				
Pembroke	Woodbine	Once	E. Coli	1				
Peru	Camp Danbee	Weekly	E. Coli	14				
Pittsfield	Lulu Pond Beach	Weekly	Enterococci	15	3	80	200	3
Plainfield	Plainfield Pond	Monthly	E. Coli	4				
Plymouth	Barrett Pond	Weekly	Enterococci	13				
Plymouth	Bloody Pond - Baird Center	Weekly	E. Coli	5				
Plymouth	Blueberry Hill Camp - Curlew Pond	Weekly	E. Coli	14				
Plymouth	Camp Bournedale - Great Herring Pond	Weekly	E. Coli	12				
Plymouth	Camp Clark YMCA - Hyles Pond	Weekly	E. Coli	9				
Plymouth	Camp Dennen - Hedges Pond	Weekly	E. Coli	11				
Plymouth	Camp Massasoit - Elbow Pond	Weekly	E. Coli	8				
Plymouth	Charge Pond	Weekly	Enterococci	13				
Plymouth	College Pond Day Use	Weekly	Enterococci	13				
Plymouth	Curlew Pond	Weekly	Enterococci	13				
Plymouth	Ellis Haven - Ellis Pond	Weekly	E. Coli	19				
Plymouth	Ellis Haven - Swimming Hole	Weekly	E. Coli	11				
Plymouth	Fearing Pond	Weekly	Enterococci	13				
Plymouth	Fresh Pond - End Pond	Weekly	E. Coli	15	2	290	1250	
Plymouth	Fresh Pond - Mid Pond	Weekly	E. Coli	14	1	625	625	
Plymouth	Indian Head	Weekly	E. Coli	10				
Plymouth	Morton Park - Left	Weekly	E. Coli	13				
Plymouth	Morton Park - Right	Weekly	E. Coli	13				
Plymouth	Pinewood Camp - Camphouse Beach	Weekly	E. Coli	13				
Plymouth	Pinewood Camp - Crew Dock	Weekly	E. Coli	14				
Plymouth	Pinewood Camp - Pinecones Beach	Weekly	E. Coli	12				
Plymouth	Pinewood Lodge - Fresh Meadow	Weekly	E. Coli	15				
Plymouth	Plymouth Estates	Weekly	E. Coli	14				
Plymouth	Sandy Pond	Weekly	E. Coli	15				
Randolph	Ponkapoag Pond	Weekly	E. Coli	8				
Richmond	Camp Marion White	Weekly	E. Coli	17				
Richmond	Camp Russell	Weekly	E. Coli	10				
Richmond	Richmond Shores - East	Weekly	E. Coli	10				

Table 18

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Richmond	Richmond Town Beach	Weekly	E. Coli	12				
Richmond	Whitewood Assoc Beach	Weekly	E. Coli	11				
Rochester	Perry's Camp	Weekly	Enterococci	10				
Rochester	Snipituit Pond	Weekly	Enterococci	11	1	98	98	
Rockland	Hartstuff Park	Weekly	E. Coli	1				
Rockland	Hartstuff Park	Weekly	Fecal Coliform	7				
Rowe	Rowe Beach - Center	Weekly	E. Coli	16				
Rowe	Rowe Beach - Inlet	Weekly	E. Coli	13				
Rowe	Rowe Beach - Right	Weekly	E. Coli	16				
Royalston	St. Laurent Camp	Weekly	E. Coli	17				
Russell	H.A. Moses Beach	Weekly	E. Coli	10				
Rutland	Whitehall Pond Beach	Weekly	Enterococci	15				
Sandisfield	York Lake Beach	Weekly	Enterococci	16	2	148	200	1
Sandwich	Camp Good News	Weekly	E. Coli	12				
Sandwich	Dunraomin Trailer Park	Weekly	E. Coli	12				
Sandwich	Hoxie Pond	Weekly	E. Coli	13				
Sandwich	Lakefield Farms	Weekly	E. Coli	12				
Sandwich	Lakewood Hills Property Owners Assoc.	Weekly	E. Coli	12				
Sandwich	Lawrence Pond	Weekly	E. Coli	13				
Sandwich	Lawrence Pond Mobile Home Park	Weekly	E. Coli	12				
Sandwich	Peter's Pond	Weekly	E. Coli	14				
Sandwich	Peter's Pond Park (boat ramp)	Weekly	E. Coli	13				
Sandwich	Pimlico Pond	Weekly	E. Coli	13				
Sandwich	Rolling Ridge Homeowners Assoc.- Lawrence Pond	Weekly	E. Coli	12				
Sandwich	Snake Pond	Weekly	E. Coli	14				
Sandwich	Triangle Pond	Weekly	E. Coli	13				
Sandwich	Wakeby Pond	Weekly	E. Coli	14				
Saugus	DCR - Pearce Lake @ Breakheart	Weekly	Enterococci	15				
Saugus	DCR - Pecham Pond @ Camp Nihan	Weekly	Enterococci	14	5	65	570	
Savoy	North Pond Beach	Weekly	Enterococci	17	3	72	600	2
Savoy	South Pond Beach	Weekly	Enterococci	16	1	72	72	1
Sharon	Camp Gannett Beach	Weekly	E. Coli	9				

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Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Sharon	Camp Gannett Israel Beach	Weekly	E. Coli	7				
Sharon	Camp Wonderland Beach	Weekly	E. Coli	11				
Sharon	Community Center Beach	Twice per week	E. Coli	27	1	370	370	1
Sharon	Horizons for Youth Beach	Weekly	E. Coli	11				
Sharon	Town Beach - Boat Landing	Twice per week	E. Coli	27				
Sharon	Town Beach - Concession	Twice per week	E. Coli	27	1	340	340	1
Sharon	Town Beach - Docks	Twice per week	E. Coli	27				
Sharon	Town Beach-Boat Landing Area	Twice per week	E. Coli	27	1	830	830	1
Sheffield	Berkshire School Beach	Weekly	E. Coli	11				
Sherborn	Farm Pond	Weekly	E. Coli	12				
Shrewsbury	Sunset Beach	Weekly	E. Coli	11				
Shutesbury	Lake Wyola	Weekly	Enterococci	20	3	94	114	5
Southwick	South Pond Beach - North	Weekly	E. Coli	8				
Spencer	Camp Marshall - Thompson	Weekly	E. Coli	8				
Spencer	Howe Pond Beach	Once	E. Coli	1				
Spencer	Lake Whittenmore	Weekly	E. Coli	10				
Spencer	Stiles - Camp Larel Wood	Weekly	E. Coli	13				
Springfield	Bass Pond - Left	Weekly	E. Coli	8	1	370	370	
Springfield	Bass Pond - Right	Weekly	E. Coli	8	2	278	430	
Springfield	Camp Wilder - Left	Weekly	E. Coli	8				
Springfield	Camp Wilder - Right	Weekly	E. Coli	8				
Springfield	Five Mile Pond - Left	Weekly	E. Coli	10	2	340	2400	
Springfield	Five Mile Pond - Right	Weekly	E. Coli	10	2	324	1175	
Springfield	Knights of Columbus - Left	Weekly	E. Coli	10				
Springfield	Knights of Columbus - Right	Weekly	E. Coli	10				
Springfield	Lake Lorraine	Weekly	Enterococci	18	4	310	600	4
Springfield	Paddle Club - Left	Weekly	E. Coli	10	1	240	240	
Springfield	Paddle Club - Right	Weekly	E. Coli	10				
Sterling	Lake Waushacum #1	Weekly	E. Coli	11	1	1119	1119	
Sterling	Lake Waushacum #2	Weekly	E. Coli	11				

Table 18

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Stockbridge	Beachwood Assoc. - Stockbridge Bowl	Weekly	E. Coli	4				
Stockbridge	Beachwood Assoc. - Stockbridge Bowl	Weekly	E. Coli	12				
Stockbridge	Berkshire Country Day School	Weekly	E. Coli	21				
Stockbridge	Camp Mahkeenac	Weekly	E. Coli	25				
Stockbridge	Kripalu	Weekly	E. Coli	12				
Stockbridge	Larrywaug Brook	Weekly	E. Coli	11				
Stockbridge	Mahkeenac Shores	Weekly	E. Coli	12				
Stockbridge	Sports School Day Camp	Weekly	E. Coli	11	1	325	325	
Stockbridge	Stockbridge Bowl	Weekly	E. Coli	11				
Stockbridge	Tanglewood	Weekly	E. Coli	12				
Stockbridge	White Pines	Weekly	E. Coli	12				
Stoughton	Ames Pond	Weekly	E. Coli	16	3	250	2000	
Stow	Lake Boone	Weekly	E. Coli	8				
Sturbridge	Oak Cove	Weekly	E. Coli	14				
Sturbridge	Outdoor World Beach	Weekly	E. Coli	14	1	780	780	
Sturbridge	Sturbridge Host Hotel	Weekly	E. Coli	14				
Sturbridge	Sturbridge Recreation - Cedar Pond	Weekly	E. Coli	12	1	460	460	
Sturbridge	Walker Pond	Weekly	E. Coli	14				
Sturbridge	Walker Pond	Weekly	Enterococci	15				
Sutton	Camp Blanchard	Weekly	E. Coli	11				
Sutton	Camp Marion	Weekly	E. Coli	10				
Sutton	King's Campground	Weekly	E. Coli	19				
Sutton	Old Holbrook Campground	Weekly	E. Coli	17				
Sutton	Sutton Falls Camp	Weekly	E. Coli	15	1	800	800	
Taunton	Campers Beach / Middle Pond	Weekly	Enterococci	11				
Taunton	Watsons Pond	Weekly	Enterococci	10	1	350	350	
Templeton	Beamans Pond	Weekly	Enterococci	16	1	130	130	
Templeton	Beamans Pond Campground	Weekly	Enterococci	16	1	100	100	
Tisbury	Long Cove (fresh)	Weekly	E. Coli	7				
Tisbury	Tisbury Great Pond	Weekly	E. Coli	7				
Tolland	Camp Kinderland Beach	Weekly	E. Coli	9				
Tolland	Camp Timbertrails	Weekly	E. Coli	14				
Tolland	Twin-Brook Camping Area	Three times	E. Coli	3				

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Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Topsfield	Hood's Pond	Weekly	E. Coli	9				
Townsend	Pearl Hill Pond Beach	Weekly	Enterococci	16	1	80	80	1
Tyngsborough	Town	Weekly	E. Coli	12	1	450	450	
Tyringham	Tyringham Park Beach	Weekly	E. Coli	14				
Upton	Pratt Pond	Weekly	E. Coli	10				
Upton	Taft Pond Beach	Weekly	E. Coli	10				
Upton	Wildwood Bond Beach	Weekly	E. Coli	10				
Uxbridge	Fairwoods	Unknown	E. Coli	5	1	420	420	
Uxbridge	West Hill Park	Weekly	E. Coli	17	3	380	880	
Wales	Lake Land	Weekly	E. Coli	13				
Wales	Sichol	Weekly	E. Coli	14	1	640	640	
Wales	Town Beach	Weekly	E. Coli	13				
Walpole	Sharon Country Day Camp Brook	Weekly	E. Coli	7				
Walpole	Sharon Country Day Camp Pond	Weekly	E. Coli	9				
Wareham	Glen Charlie at Shangri-La	Weekly	E. Coli	12				
Wareham	Glen Charlie at Sunset	Weekly	E. Coli	12				
Warren	Comin's Pond	Weekly	E. Coli	9				
Wayland	Lake Cochituate - Left Buoy (deep)	Weekly	E. Coli	13				
Wayland	Lake Cochituate - Left Shallow	Weekly	E. Coli	13				
Wayland	Lake Cochituate - Middle	Weekly	E. Coli	13				
Wayland	Lake Cochituate - Right Shallow	Weekly	E. Coli	12				
Webster	Beacon Park	Weekly	E. Coli	15				
Webster	Birch Island	Weekly	E. Coli	9				
Webster	Colonial Park	Weekly	E. Coli	14				
Webster	Indian Ranch	Weekly	E. Coli	13				
Webster	Kildeer Island	Weekly	E. Coli	14				
Webster	Lakeside	Weekly	E. Coli	14				
Webster	Memorial Beach #1	Weekly	E. Coli	14				
Webster	Memorial Beach #2	Weekly	E. Coli	15				
Webster	Nipmuc Cove	Three Times	E. Coli	3				
Webster	Point Breeze	Weekly	E. Coli	8				
Webster	South Point	Once	E. Coli	1				
Webster	Treasure Island	Weekly	E. Coli	14				
Wellesley	Green Beach - Deep	Weekly	E. Coli	11	1	270	270	
Wellesley	Green Beach - Shallow	Weekly	E. Coli	11	4	250	440	

Table 18

Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Wellesley	Morses Beach - Deep	Weekly	E. Coli	10				
Wellesley	Morses Beach - Shallow	Weekly	E. Coli	12				
Wellfleet	Duck Pond	Weekly	E. Coli	13				
Wellfleet	Dyer Pond	Weekly	E. Coli	11				
Wellfleet	Great Pond	Weekly	E. Coli	14				
Wellfleet	Gull Pond	Weekly	E. Coli	14				
Wellfleet	Gull Pond (2)	Weekly	E. Coli	13				
Wellfleet	Higgins Pond	Weekly	E. Coli	14				
Wellfleet	Long Pond	Weekly	E. Coli	14				
Wellfleet	Spectacle Pond	Weekly	E. Coli	13				
Wenham	Gull Pond	Weekly	E. Coli	5				
West Brookfield	Lake Wickabog - Main Beach	Weekly	E. Coli	7				
West Brookfield	Lake Wickabog - Main Beach	Weekly	E. Coli	7				
West Brookfield	Lake Wickabog - Main Beach	Weekly	E. Coli	7				
West Brookfield	Lake Wickabog - Small Beach	Weekly	E. Coli	7				
West Brookfield	Lake Wickabog - Small Beach	Weekly	E. Coli	7				
West Stockbridge	Card Pond Beach	Weekly	E. Coli	16				
West Stockbridge	Crane Lake Camp	Weekly	E. Coli	10				
West Tisbury	Coca-Cola Brook @ Beach	Weekly	E. Coli	7				
West Tisbury	Pond	Twice	E. Coli	2				
West Tisbury	Seth's Pond Beach #1 (Focus)	Weekly	E. Coli	9				
West Tisbury	Seth's Pond Cove #2 (Focus)	Weekly	E. Coli	9				
Westborough	Lake Chauncy Beach #1	Weekly	E. Coli	10				
Westfield	Kingsley	Weekly	Enterococci	18	3	168	600	3
Westfield	Lambert's	Weekly	Enterococci	17	1	124	124	2
Westford	East Boston Camps - Boys Beach	Weekly	E. Coli	15				
Westford	East Boston Camps - Day Care	Weekly	E. Coli	10				
Westford	East Boston Camps - Girls Beach	Weekly	E. Coli	14				
Westford	Edwards Beach - Left	Once	E. Coli	1				
Westford	Edwards Beach - Right	Once	E. Coli	1				
Westford	Edwards Town Beach	Weekly	E. Coli	18	2	600	600	2
Westford	Forge Village Beach	Weekly	E. Coli	17	1	600	600	1
Westford	Lakeside Meadows	Weekly	E. Coli	15				
Westford	Marylou's Beach - NIA Beach	Weekly	E. Coli	14				

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Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Westford	Nashoba Ski Area - Day Campers Beach	Weekly	E. Coli	15				
Westford	Nashoba Ski Area - Swim Club Beach	Weekly	E. Coli	15				
Westford	North Beach - NIA Beach	Weekly	E. Coli	16	1	600	600	1
Westford	Sandy Beach - NIA Beach	Weekly	E. Coli	14				
Westford	Wymans Campers Beach	Weekly	E. Coli	15				
Westford	Wymans Main Beach - North	Weekly	E. Coli	15				
Westford	Wymans Main Beach - South	Weekly	E. Coli	15				
Westminster	Crow Hill Pond Beach	Weekly	Enterococci	17	4	68	216	2
Weston	River Day Camp	Weekly	E. Coli	12	1	540	540	
Westport	Sawdy Pond	Weekly	Enterococci	15	5	68	266	
Westport	South Watuppa Pond	Weekly	Enterococci	15	1	435	435	
Westwood	Grossman Beach	Weekly	E. Coli	9				
Westwood	Membership Beach	Weekly	Enterococci	15	1	180	180	1
Westwood	North Beach	Weekly	E. Coli	15				
Westwood	Powissett	Weekly	E. Coli	12				
Wilbraham	9 Mile Pond	Weekly	E. Coli	7	1	4000	4000	
Wilbraham	Spec Pond Beach	Weekly	E. Coli	7				
Wilbraham	Spec Pond Camp	Weekly	E. Coli	6				
Williamstown	Margaret Lindley Park	Twice per month	E. Coli	7				
Wilmington	Baby Beach	Weekly	E. Coli	15	2	280	505	
Wilmington	Town Beach	Weekly	E. Coli	19	5	285	700	5
Wilmington	Town Beach	Weekly	E. Coli	11	3	310	480	
Winchendon	Lake Dennison State Park	Weekly	Enterococci	15				
Winchendon	Lake Dennison State Park	Weekly	Enterococci	15				
Winchester	Wedge Pond - North	Weekly	Enterococci	9				
Winchester	Wedge Pond - South	Weekly	Enterococci	9				
Windsor	Westfield River Beach	Weekly	Enterococci	46	13	84	600	2
Worcester	Bell Pond Beach	Weekly	E. Coli	6				
Worcester	Coes Pond Hillside	Weekly	E. Coli	6				
Worcester	Coes Pond Mill St. Beach	Weekly	E. Coli	6				
Worcester	Indian Lake Public Beach	Weekly	E. Coli	6				
Worcester	Indian Lake Shore Park	Weekly	E. Coli	6				

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Water quality data for freshwater public and semi-public bathing beaches in Massachusetts in 2004.

Community	Beach Name[1]	Testing Frequency	Indicator Type	# of Tests	# of Single Sample Exceedances	Minimum Exceedance	Maximum Exceedance	Number of Postings[2]
Worcester	Lake Quinsigamond-Lake Park Beach	Weekly	Enterococci	18	2	62	150	1
Worcester	Lake Quinsigamond-Regatta Point Beach	Weekly	Enterococci	22	6	74	134	4
Worthington	Berkshire Parks Camp	Monthly	E. Coli	5				
Wrentham	Lake Archer	Weekly	E. Coli	15				
Wrentham	Lake Pearl Boat Landing	Weekly	E. Coli	13				
Wrentham	Lake Pearl Park	Weekly	E. Coli	16				
Wrentham	Mirror Lake	Weekly	E. Coli	14	2	260	280	
Wrentham	Sweatt Beach	Weekly	E. Coli	13				
Yarmouth	Big Sandy Pond	Weekly	E. Coli	12				
Yarmouth	Camp Greenough - Boy Scouts	Weekly	E. Coli	8				
Yarmouth	Dennis Pond	Weekly	E. Coli	14				
Yarmouth	Elijah's Pond, Camp Wingate	Weekly	E. Coli	12				
Yarmouth	Flax Pond	Weekly	E. Coli	13				
Yarmouth	Horse Pond	Weekly	E. Coli	13				
Yarmouth	Horse Pond - Halcyon Condos	Weekly	E. Coli	12				
Yarmouth	Little Sandy Pond	Weekly	E. Coli	13				
Yarmouth	Long Pond - Indian	Weekly	E. Coli	13				
Yarmouth	Long Pond - Lyman	Weekly	E. Coli	13				

1 - Multiple instances of beaches may occur due to multiple sampling points.

2 - The number of postings could be greater than the number of single sample exceedances due to the presence of geometric mean exceedances.

Table 19

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2004.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Data
Abington				X	X	
Acton				X	X	
Acushnet						
Adams						
Agawam				X	X	X
Alford						
Amesbury				X	X	X
Amherst						
Andover				X	X	X
Aquinnah	X	X				
Arlington				X	X	
Ashburnham				X	X	X
Ashby				X	X	X
Ashfield				X	X	
Ashland				X	X	
Athol				X	X	
Attleboro						
Auburn				X	X	
Avon						
Ayer				X	X	
Barnstable	X	X	X	X	X	X
Barre						
Becket				X	X	X
Bedford				X	X	X
Belchertown				X	X	
Bellingham				X	X	X
Belmont						
Berkley						
Berlin						
Bernardston						
Beverly	X	X	X			
Billerica				X	X	
Blackstone						
Blandford						
Bolton				X	X	X
Boston	X	X		X	X	X
Bourne	X	X	X	X	X	X
Boxborough						
Boxford				X	X	X
Boylston						
Braintree	X	X		X	X	X

Table 19

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2004.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Data
Brewster	X	X	X	X	X	X
Bridgewater						
Brimfield				X	X	
Brockton						
Brookfield				X	X	X
Brookline						
Buckland						
Burlington						
Cambridge						
Canton						
Carlisle						
Carver				X	X	X
Charlemont				X	X	
Charlton				X	X	X
Chatham	X	X	X	X	X	X
Chelmsford				X	X	
Chelsea						
Cheshire						
Chester						
Chesterfield				X	X	
Chicopee				X	X	
Chilmark	X	X	X			
Clarksburg				X	X	
Clinton						
Cohasset	X	X				
Colrain						
Concord				X	X	
Conway				X	X	
Cummington				X	X	X
Dalton						
Danvers	X	X	X			
Dartmouth[1]	X	X	X	X		X
Dedham						
Deerfield						
Dennis	X	X	X	X	X	
Dighton						
Douglas				X	X	
Dover						
Dracut				X	X	X
Dudley				X	X	X
Dunstable						

Table 19

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2004.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Data
Duxbury	X	X	X			
East Bridgewater						
East Brookfield				X	X	X
East Longmeadow						
Eastham	X	X	X	X	X	
Easthampton						
Easton				X	X	
Edgartown	X	X	X			
Egremont				X	X	
Erving				X	X	
Essex	X	X		X	X	
Everett						
Fairhaven	X	X	X			
Fall River						
Falmouth	X	X	X	X	X	X
Fitchburg						
Florida				X	X	
Foxborough						
Framingham				X	X	X
Franklin[1]				X		X
Freetown				X	X	
Gardner				X	X	
Georgetown				X	X	
Gill						
Gloucester	X	X				
Goshen				X	X	
Gosnold						
Grafton				X	X	
Granby						
Granville						
Great Barrington				X	X	X
Greenfield				X	X	
Groton				X	X	
Groveland						
Hadley						
Halifax				X	X	X
Hamilton						

Table 19

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2004.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Data
Hampden						
Hancock						
Hanover						
Hanson				X	X	X
Hardwick						
Harvard				X	X	
Harwich	X	X	X	X	X	X
Hatfield						
Haverhill				X	X	
Hawley						
Heath						
Hingham	X	X	X			
Hinsdale				X	X	X
Holbrook						
Holden				X	X	X
Holland						
Holliston				X	X	
Holyoke						
Hopedale						
Hopkinton				X	X	
Hubbardston				X	X	
Hudson				X	X	
Hull	X	X				
Huntington				X	X	X
Ipswich	X	X		X	X	
Kingston	X	X		X		X
Lakeville				X	X	X
Lancaster				X	X	X
Lanesborough				X	X	X
Lawrence						
Lee				X	X	
Leicester						
Lenox				X	X	
Leominster				X	X	X
Leverett				X	X	
Lexington				X	X	X
Leyden						
Lincoln						
Littleton				X	X	
Longmeadow						
Lowell				X	X	X

Table 19

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2004.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Data
Ludlow				X	X	
Lunenburg				X	X	
Lynn	X	X		X	X	
Lynnfield						
Malden						
Manchester-by-the-Sea	X	X				
Mansfield						
Marblehead	X	X	X			
Marion	X	X	X			
Marlborough				X	X	X
Marshfield	X	X	X			
Mashpee	X	X	X	X	X	X
Mattapoisett	X	X	X			
Maynard						
Medfield				X	X	
Medford				X	X	X
Medway				X	X	
Melrose						
Mendon				X	X	
Merrimac				X	X	X
Methuen				X	X	
Middleborough				X	X	
Middlefield						
Middleton				X	X	
Milford						
Millbury						
Millis						
Millville						
Milton				X	X	
Monroe						
Monson						
Montague						
Monterey				X	X	
Montgomery						
Mount Washington				X	X	
Nahant	X	X				
Nantucket	X	X	X	X	X	X
Natick				X	X	X
Needham						

Table 19

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2004.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Data
New Ashford						
New Bedford[1]	X	X	X	X		X
New Braintree						
New Marlborough				X	X	
New Salem						
Newbury	X	X				
Newburyport	X	X	X			
Newton				X	X	X
Norfolk						
North Adams				X	X	X
North Andover				X	X	
North Attleborough				X	X	X
North Brookfield				X	X	X
North Reading						
Northampton				X	X	X
Northborough						
Northbridge				X	X	X
Northfield						
Norton				X	X	X
Norwell						
Norwood						
Oak Bluffs	X	X	X			
Oakham				X	X	
Orange				X	X	X
Orleans	X	X	X	X	X	
Otis				X	X	
Oxford				X	X	X
Palmer						
Paxton						
Peabody						
Pelham						
Pembroke				X	X	X
Pepperell						
Peru				X	X	
Petersham						
Phillipston						
Pittsfield				X	X	X

Table 19

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2004.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Data
Plainfield				X	X	X
Plainville						
Plymouth	X	X	X	X	X	X
Plympton						
Princeton						
Provincetown	X	X	X			
Quincy	X	X				
Randolph				X	X	
Raynham						
Reading						
Rehoboth						
Revere	X	X				
Richmond				X	X	
Rochester				X	X	
Rockland				X	X	X
Rockport	X	X				
Rowe				X	X	
Rowley						
Royalston				X	X	
Russell				X	X	
Rutland				X	X	
Salem	X	X	X			
Salisbury	X	X				
Sandisfield				X	X	
Sandwich	X	X	X	X	X	X
Saugus				X	X	
Savoy				X	X	
Scituate	X	X	X			
Seekonk						
Sharon				X	X	
Sheffield				X	X	
Shelburne						
Sherborn				X	X	
Shirley						
Shrewsbury				X	X	
Shutesbury				X	X	
Somerset	X	X	X			
Somerville						
South Hadley						
Southampton						
Southborough						

Table 19

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2004.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Data
Southbridge						
Southwick				X	X	X
Spencer				X	X	X
Springfield				X	X	X
Sterling				X	X	X
Stockbridge				X	X	X
Stoneham						
Stoughton				X	X	
Stow				X	X	X
Sturbridge				X	X	
Sudbury						
Sunderland						
Sutton				X	X	X
Swampscott	X	X	X			
Swansea	X	X	X			
Taunton				X	X	
Templeton				X	X	
Tewksbury						
Tisbury	X	X	X	X	X	X
Tolland				X	X	X
Topsfield				X	X	X
Townsend				X	X	X
Truro	X	X	X			
Tyngsborough				X	X	
Tyringham				X	X	
Upton				X	X	
Uxbridge				X	X	X
Wakefield						
Wales				X	X	
Walpole				X	X	X
Waltham						
Ware						
Wareham	X	X	X	X	X	
Warren				X	X	X
Warwick						
Washington						
Watertown						
Wayland				X	X	
Webster				X	X	X
Wellesley				X	X	
Wellfleet	X	X	X	X	X	X

Table 19

Communities in Massachusetts, indicating type of beach and the presence or absence of data in 2004.

Community	Marine Beach	Marine Beach with Data	Marine Beach w/o Data	Freshwater Beach	Freshwater Beach with Data	Freshwater Beach w/o Data
Wendell						
Wenham				X	X	X
West Boylston						
West Bridgewater						
West Brookfield				X	X	X
West Newbury						
West Springfield						
West Stockbridge				X	X	X
West Tisbury	X	X	X	X	X	X
Westborough				X	X	X
Westfield				X	X	
Westford				X	X	X
Westhampton						
Westminster				X	X	
Weston				X	X	
Westport	X	X	X	X	X	X
Westwood				X	X	X
Weymouth[1]	X	X		X		X
Whately						
Whitman						
Wilbraham				X	X	X
Williamsburg						
Williamstown				X	X	X
Wilmington				X	X	X
Winchendon				X	X	
Winchester				X	X	X
Windsor				X	X	
Winthrop	X	X	X			
Woburn						
Worcester				X	X	X
Worthington				X	X	X
Wrentham				X	X	
Yarmouth	X	X	X	X	X	X

1 - These communities did not open their freshwater beaches during the 2004 beach season.

Table 20

Beach season (June – August) rainfall data for Boston, 2001-2004*

Year	Boston				
	Rainfall	June	July	August	Total
2001	Total	4.99	2.13	4.14	11.26
	Dev From Norm	1.90	-0.71	0.90	2.09
2002	Total	4.78	1.42	2.13	8.33
	Dev From Norm	1.69	-1.42	-1.11	-0.84
2003	Total	4.69	2.11	3.02	9.82
	Dev From Norm	1.47	-0.95	-0.36	0.16
2004	Total	1.93	3.87	4.37	10.17
	Dev From Norm	-1.28	0.81	0.98	0.51

Table 21

Beach season (June – August) rainfall data for Chatham, 2001-2004*

Year	Chatham				
	Rainfall	June	July	August	Total
2001	Total	3.00	3.35	5.36	11.71
	Dev From Norm	-0.44	-0.02	2.02	1.56
2002	Total	2.88	0.48	2.45	5.81
	Dev From Norm	-0.56	-2.89	-0.89	-4.34
2003	Total	5.07	1.78	3.46	10.31
	Dev From Norm	1.63	-1.59	0.12	0.16
2004	Total	1.60	2.48	5.49	9.57
	Dev From Norm	-1.83	-0.88	2.13	-0.58

* obtained from the National Weather Service Forecast office, at http://www.erh.noaa.gov/er/box/dailystns.shtml

Table 22

2004 Marine Beach samples, exceedance and proximity to known pollution sources when a pollution source was specified

Sample Sites	2004 Samples	2004 Exceedances	% Exceedance
Near Pollution Sources	1,622	90	5.5%
No Known Pollution Source	6,246	246	3.9%
Total	7,868	336	4.3%

Table 23

Time of day when samples were collected at public and semi-public bathing beaches in Massachusetts in 2004

	Marine		Fresh	
Time of Sample	**# Samples**	**% Samples**	**# Samples**	**% Samples**
Before 10:00 AM	4,746	60.3%	2,802	38.3%
Between 10:00 AM and 12:00 PM	1,871	23.8%	1,794	24.5%
Between 12:00 PM and 4:00 PM	1,204	15.3%	1,346	18.4%
After 4:00 PM	45	0.6%	35	0.5%
Indeterminate	2	0.0%	1,336	18.3%
Total	7,868	100.0%	7,313	100.0%

Table 24

Exceedances Reported Based on the Number of Days Since Last Rainfall at Massachusetts Public and Semi-public Bathing Beaches During the 2004 Season

Marine beaches		
Number of Days Since Rain	**Number of Exceedances**	**%**
0	129	55.4%
1	32	9.5%
2	27	10.6%
3	6	1.9%
4	5	1.5%
5	10	3.1%
6	10	3.0%
7	4	1.2%
8	1	0.3%
9	6	1.8%
10	2	0.6%
10+	1	0.3%
Indeterminant	103	
Freshwater beaches		
0	81	61.4%
1	22	8.2%
2	13	4.9%
3	9	3.4%
4	0	0.0%
5	3	1.1%
6	1	0.4%
7	2	0.7%
8	0	0.0%
9	0	0.0%
10	1	0.4%
10+	0	0.0%
Indeterminant	135	

Table 25

Comparison of 2003 Top 10 Marine Beaches in terms of number of single sample exceedances versus sampling events to its respective 2004 data.

2003 Marine Beach Data

Community	Beach	Indicator Type	# of Tests[1]	# Exceedances	Range of Exceedances	%
Lynn	Kings (Stacy Brook)	Enterococci	11	5	138-610	45.5%
Chatham	Cockle Cove Creek (parking lot)	Enterococci	15	6	115-592	40.0%
Quincy	Broady (Baker)	Enterococci	16	6	118-360	37.5%
Boston	Malibu	Enterococci	20	7	136-830	35.0%
Eastham	Cook's Brook	Enterococci	26	9	130-405	34.6%
Somerset	Pearse	Enterococci	13	4	156-250	30.8%
Kingston	Gray's	Enterococci	7	2	200-680	28.6%
Swansea	Sandy Beach	Enterococci	7	2	132-148	28.6%
Winthrop	Yerrill	Enterococci	7	2	130-370	28.6%
Duxbury	Landing Road	Enterococci	12	3	580-880	25.0%
Yarmouth	Colonial Acres	Enterococci	36	9	108-400	25.0%

2004 Marine Beach Data

Community	Beach	Indicator Type	# of Tests	# Exceedances	Range of Exceedances	%
Lynn	Kings (Stacy Brook)	Enterococci	11	2	106-162	18.2%
Chatham	Cockle Cove Creek (parking lot)	Enterococci	17	10	152-578	58.8%
Quincy	Broady (Baker)	Enterococci	13	1	510	7.7%
Boston	Malibu	Enterococci	12	1	124	8.3%
Eastham	Cook's Brook	Enterococci	14	0		0.0%
Somerset	Pearse	Enterococci	16	3	136-158	18.8%
Kingston	Gray's	Enterococci	17	1	175	5.9%
Swansea	Sandy Beach	Enterococci	13	0		0.0%
Winthrop	Yerrill	Enterococci	7	1	110	14.3%
Duxbury	Landing Road	Enterococci	17	4	120-350	23.5%
Yarmouth	Colonial Acres	Enterococci	17	1	268	5.9%

1- Only beaches with over 6 or more samples during the season were considered for inclusion

Table 26

Comparison of 2003 Top 10 Freshwater Beaches in terms of number of single sample exceedances versus sampling events to its respective 2004 data.

2003 Freshwater Beach Data

Community	Beach	Indicator Type	# of Tests[1]	# Exceedances	Range of Exceedances	%
North Attleboro	Whitings Pond	E. Coli	35	18	240-2200	51.4%
Great Barrington	Green River	E. Coli	14	7	236-300	50.0%
Lakeville	Clark Shores 3	Enterococci	7	3	64-286	42.9%
Rochester	Snipituit Pond	Enterococci	9	3	66-256	33.3%
Worcester	Lake Quinsigamond-Regatta Point Beach	Enterococci	21	7	90-600	33.3%
Huntington	Westfield River Beach	Enterococci	40	13	76-420	32.5%
Braintree	Sunset Lake (left of dock)	E. Coli	10	3	344-1800	30.0%
Georgetown	American Legion Park	E. Coli	10	3	240-300	30.0%
Lexington	Old Reservoir Swim Area Right #1	Enterococci	17	5	98-204	29.4%
Springfield	Lake Lorraine	Enterococci	24	7	74-430	29.2%

2004 Freshwater Beach Data

Community	Beach	Indicator Type	# of Tests	# Exceedances	Range of Exceedances	%
North Attleboro	Whitings Pond	E. Coli	23	6	240-670	26.1%
Great Barrington	Green River	E. Coli	9	2	280-770	22.2%
Lakeville	Clark Shores 3	Enterococci	15	1	1400	6.7%
Rochester	Snipituit Pond	Enterococci	11	0		0.0%
Worcester	Lake Quinsigamond-Regatta Point Beach	Enterococci	22	6	74-134	27.3%
Huntington	Westfield River Beach	Enterococci	19	9	84-600	47.4%
Braintree	Sunset Lake (left of dock)	E. Coli	14	1	292	7.1%
Georgetown	American Legion Park	E. Coli	14	4	260-840	28.6%
Lexington	Old Reservoir Swim Area Right #1	Enterococci	18	0		0.0%
Springfield	Lake Lorraine	Enterococci	18	4	310-600	22.2%

1- Only beaches with over 6 or more samples during the season were considered for inclusion

X. FIGURES

Figure 11:
Water quality samples at public/semi-public freshwater beaches in Massachusetts for 2004

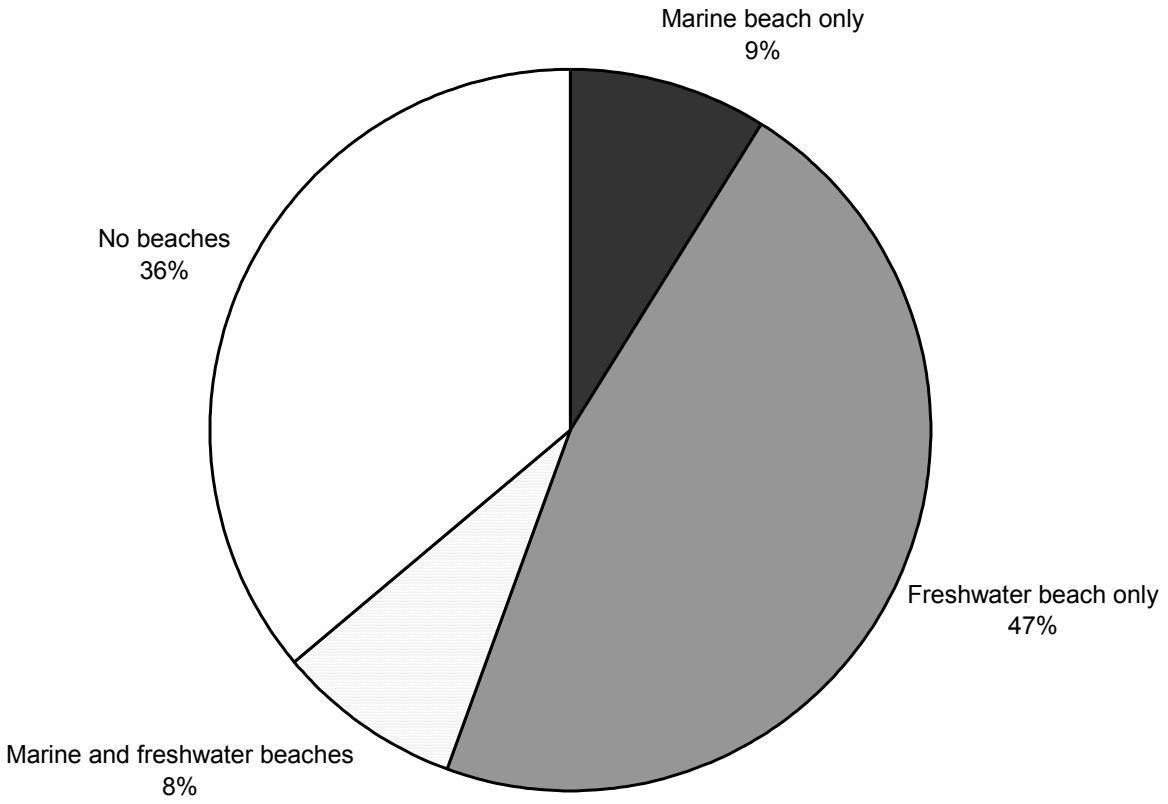


Figure 11:
Water quality samples at public/semi-public freshwater beaches in Massachusetts for 2004

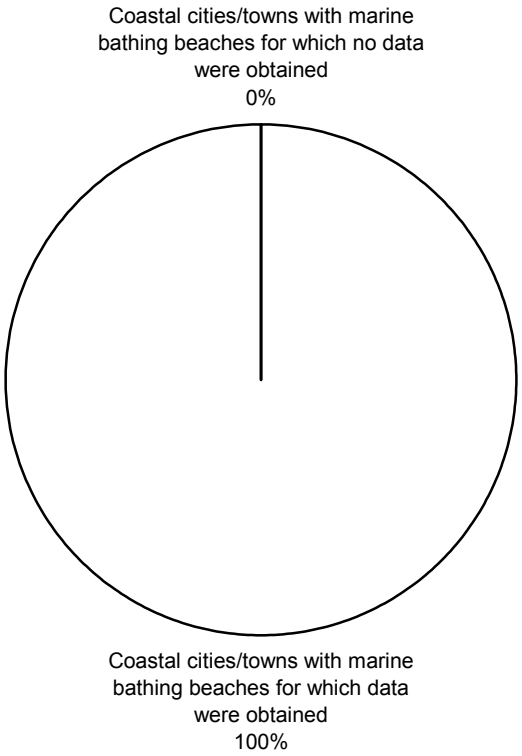


Figure 11:
Water quality samples at public/semi-public freshwater beaches in Massachusetts for 2004

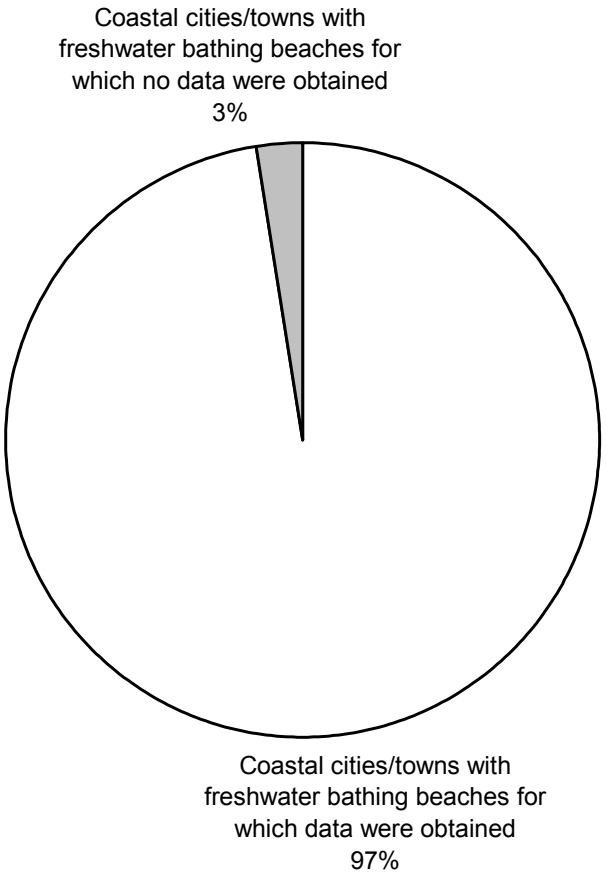


Figure 11:
Water quality samples at public/semi-public freshwater beaches in Massachusetts for 2004

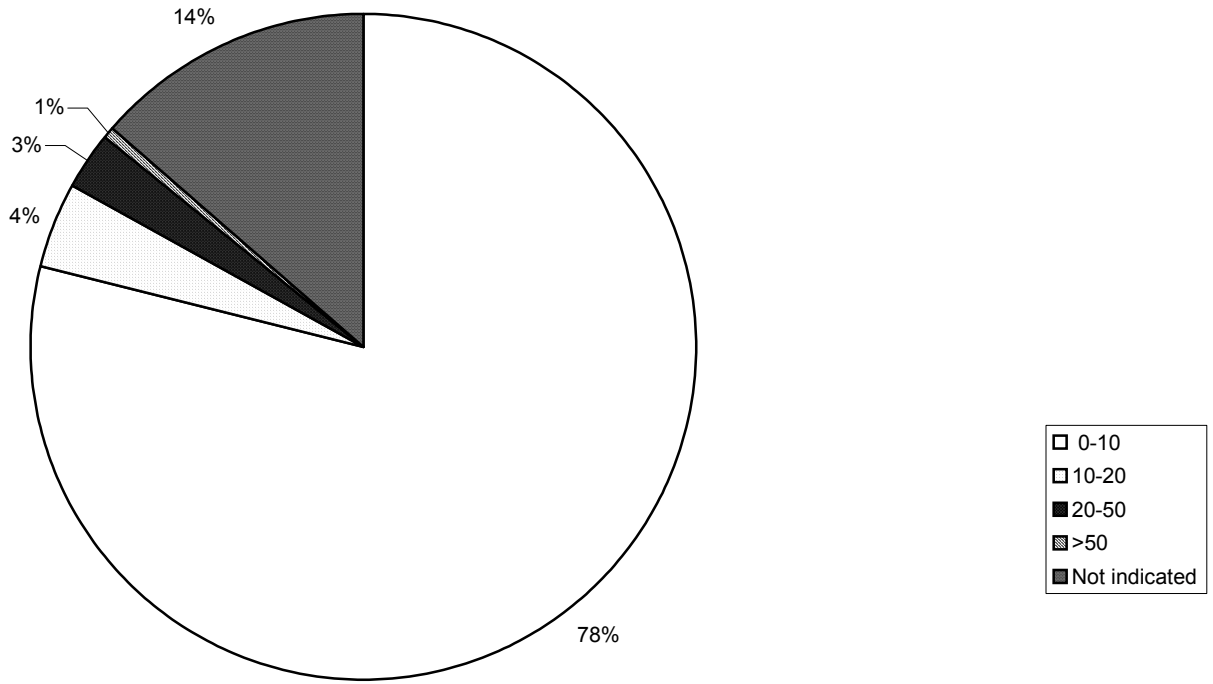


Figure 11:
Water quality samples at public/semi-public freshwater beaches in Massachusetts for 2004

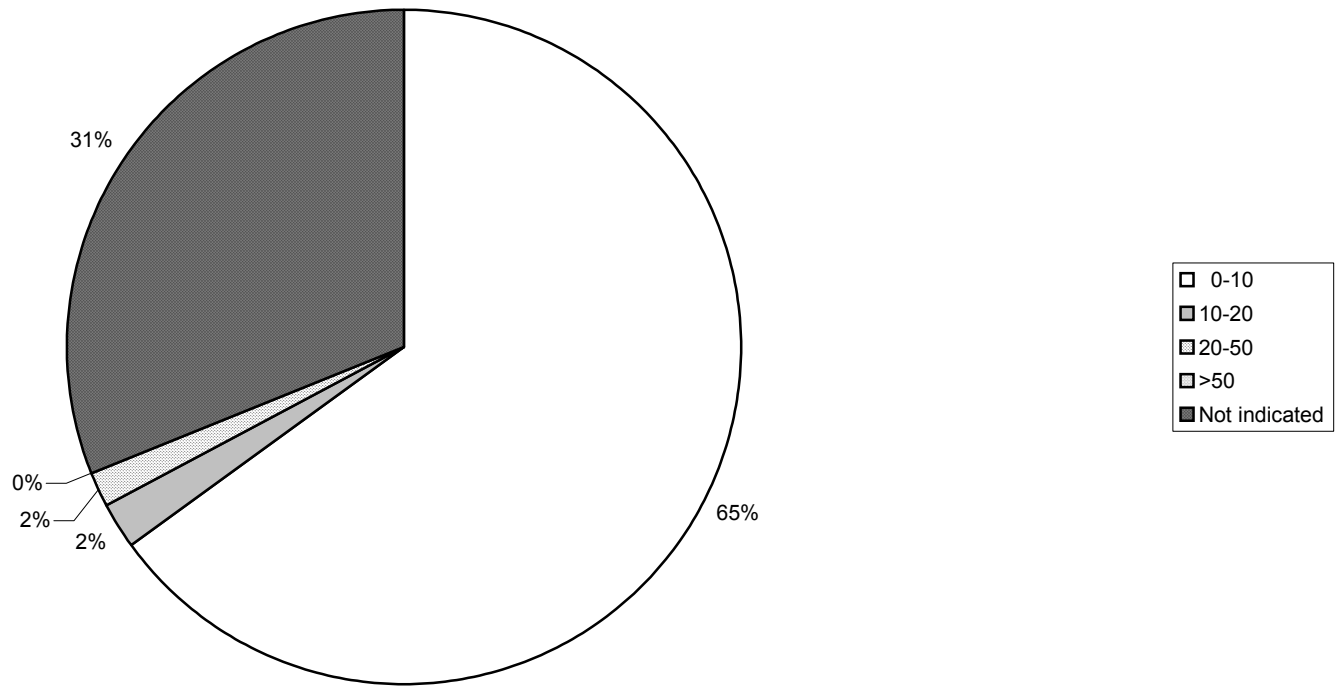
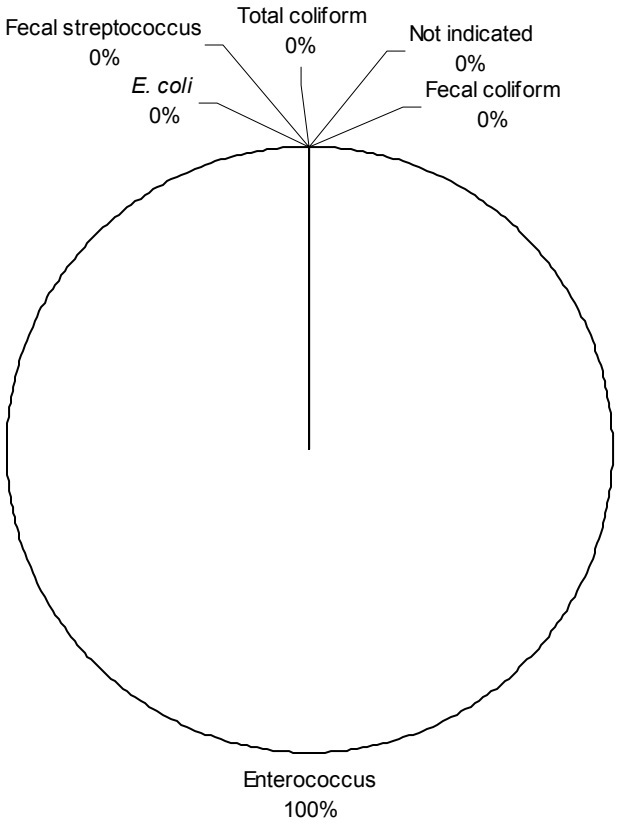


Figure 11:
Water quality samples at public/semi-public freshwater beaches in Massachusetts for 2004



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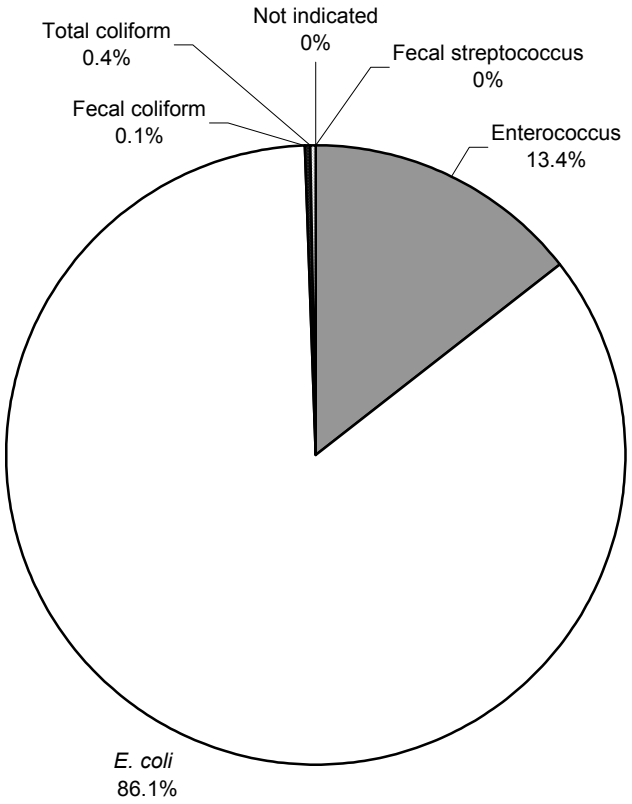
Water quality samples at public/semi-public freshwater beaches in Massachusetts for 2004



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Water quality samples at public/semi-public freshwater beaches in Massachusetts for 2004

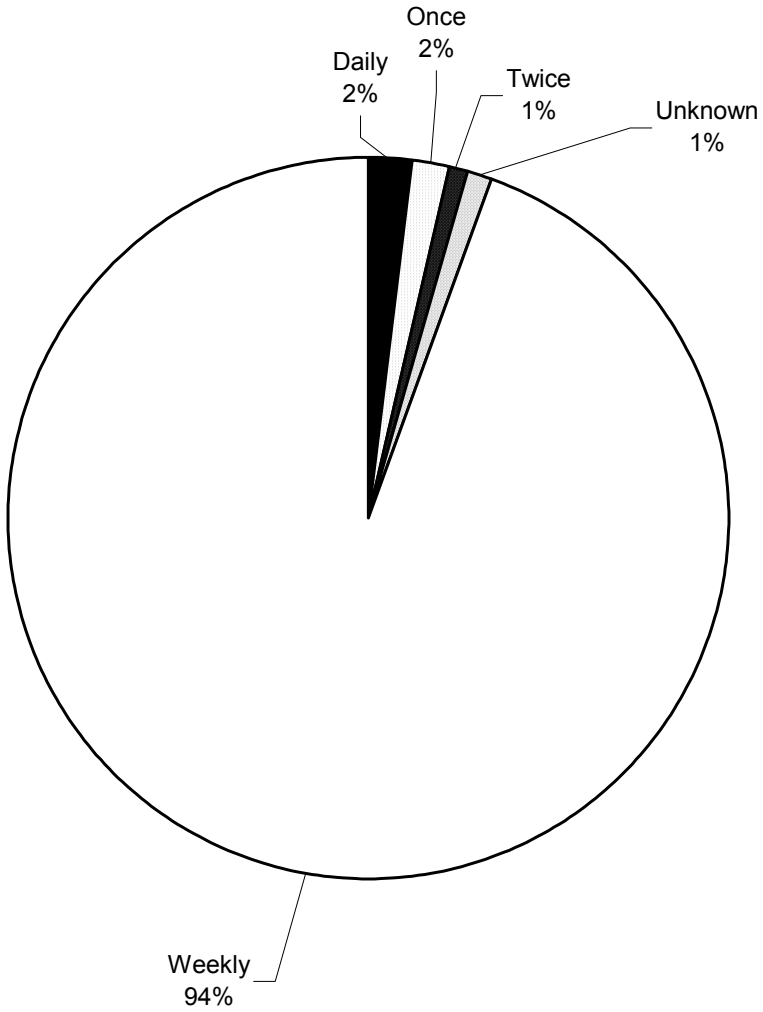


Figure 11:
Water quality samples at public/semi-public freshwater beaches in Massachusetts for 2004

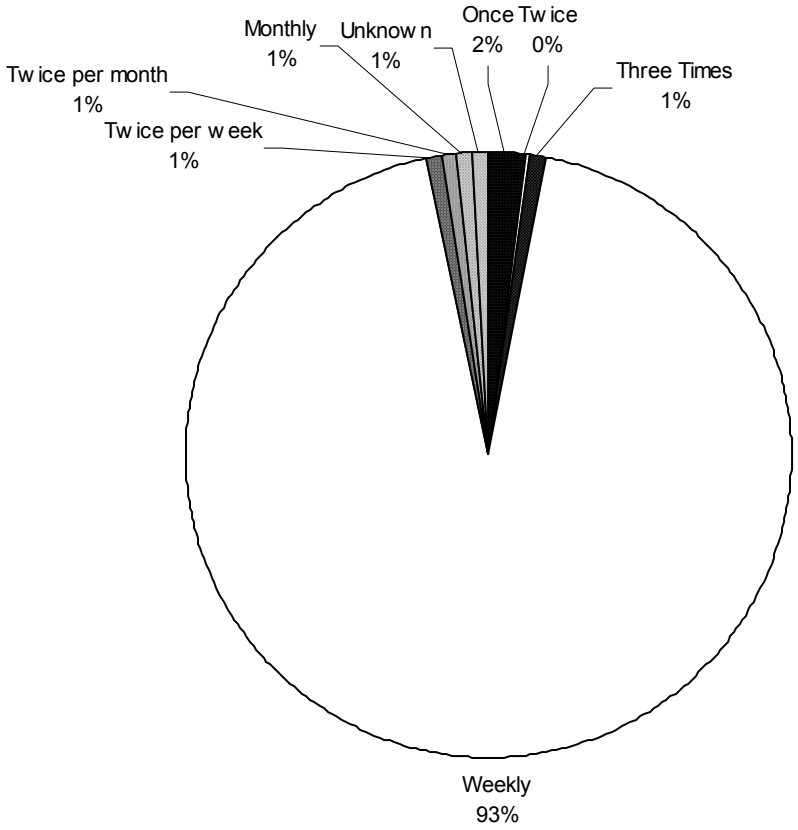


Figure 11:
Water quality samples at public/semi-public freshwater beaches in Massachusetts for 2004

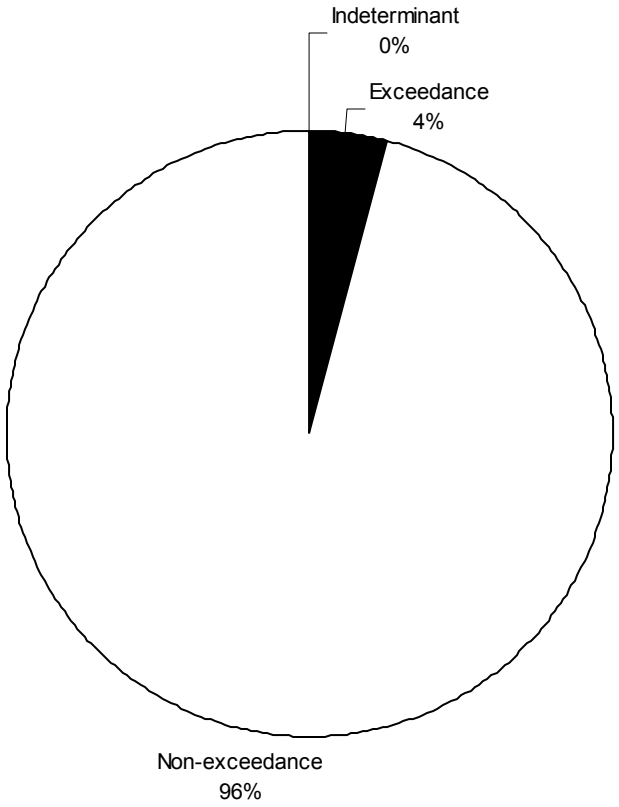
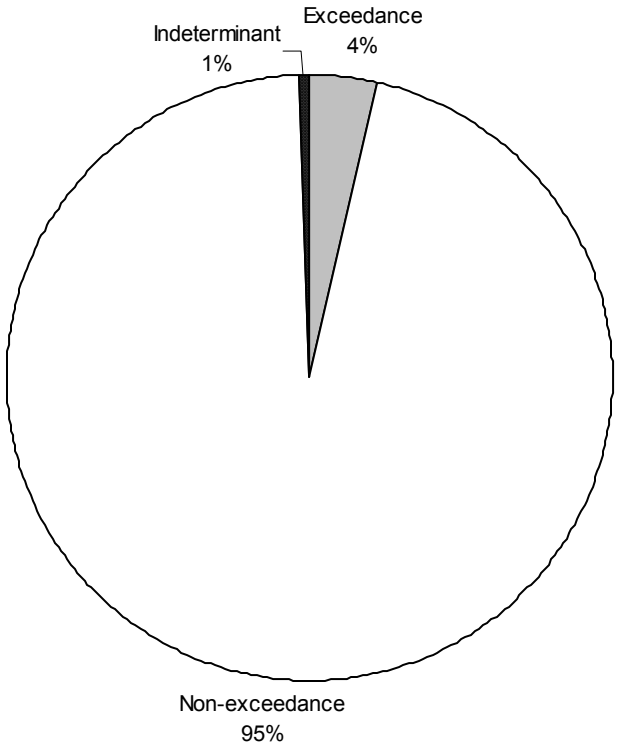


Figure 11:
Water quality samples at public/semi-public freshwater beaches in Massachusetts for 2004



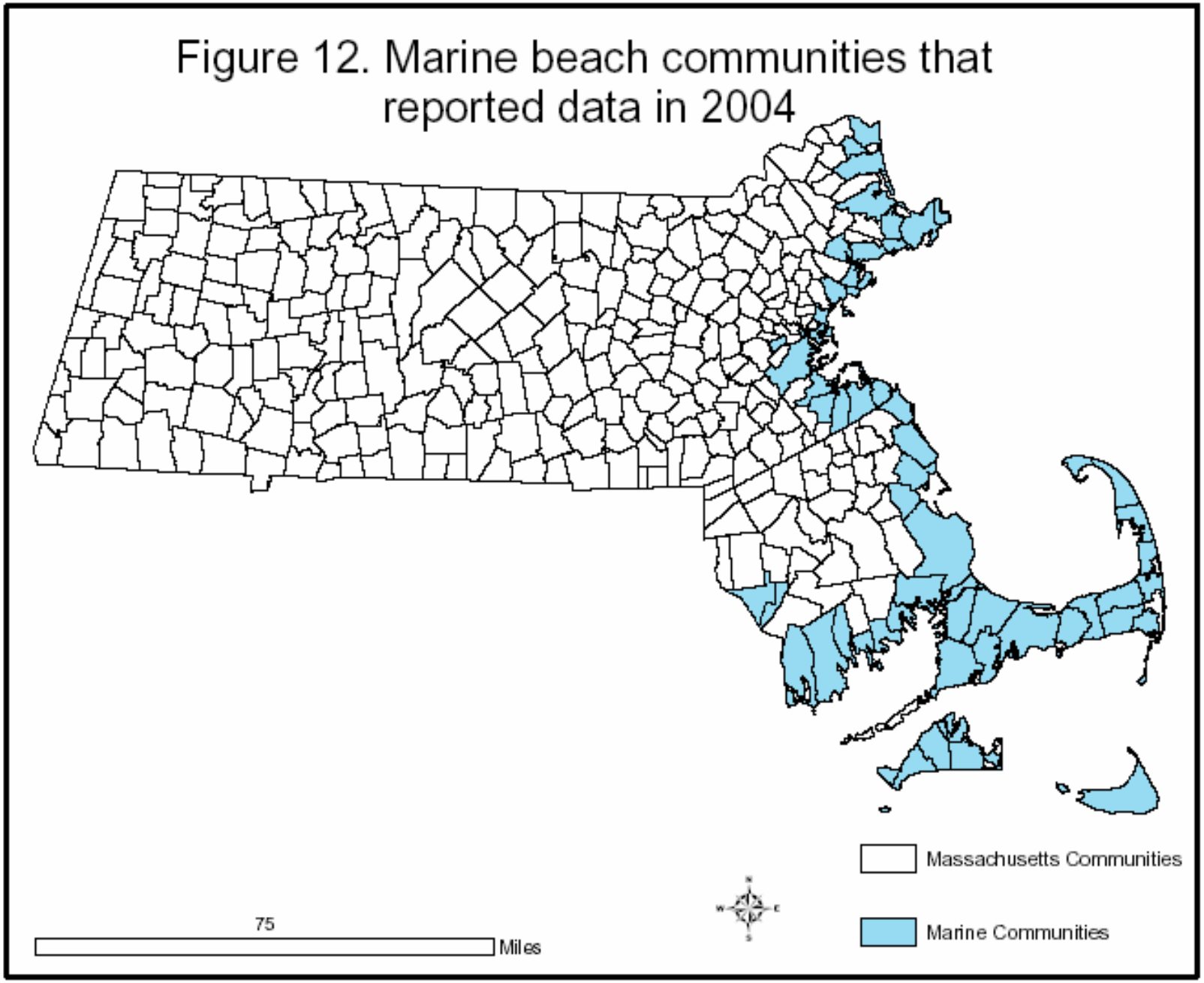


Figure 12. Marine beach communities that reported data in 2004
Massachusetts Communities
Marine Communities
75
Miles

Figure 13. Freshwater beach communities that reported data in 2004

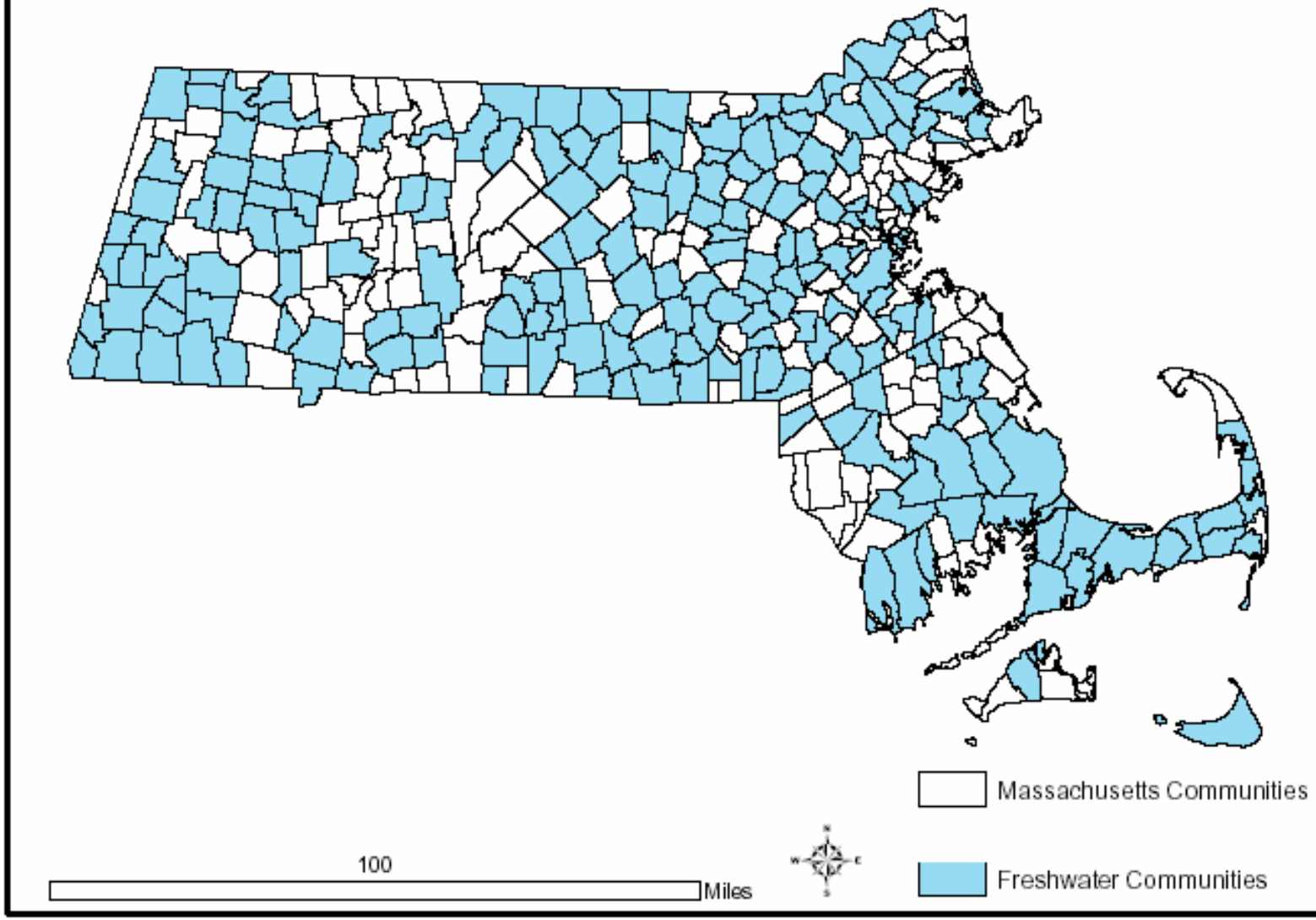


Figure 14. Marine beach communities with at least one water sample exceeding criteria in 2004

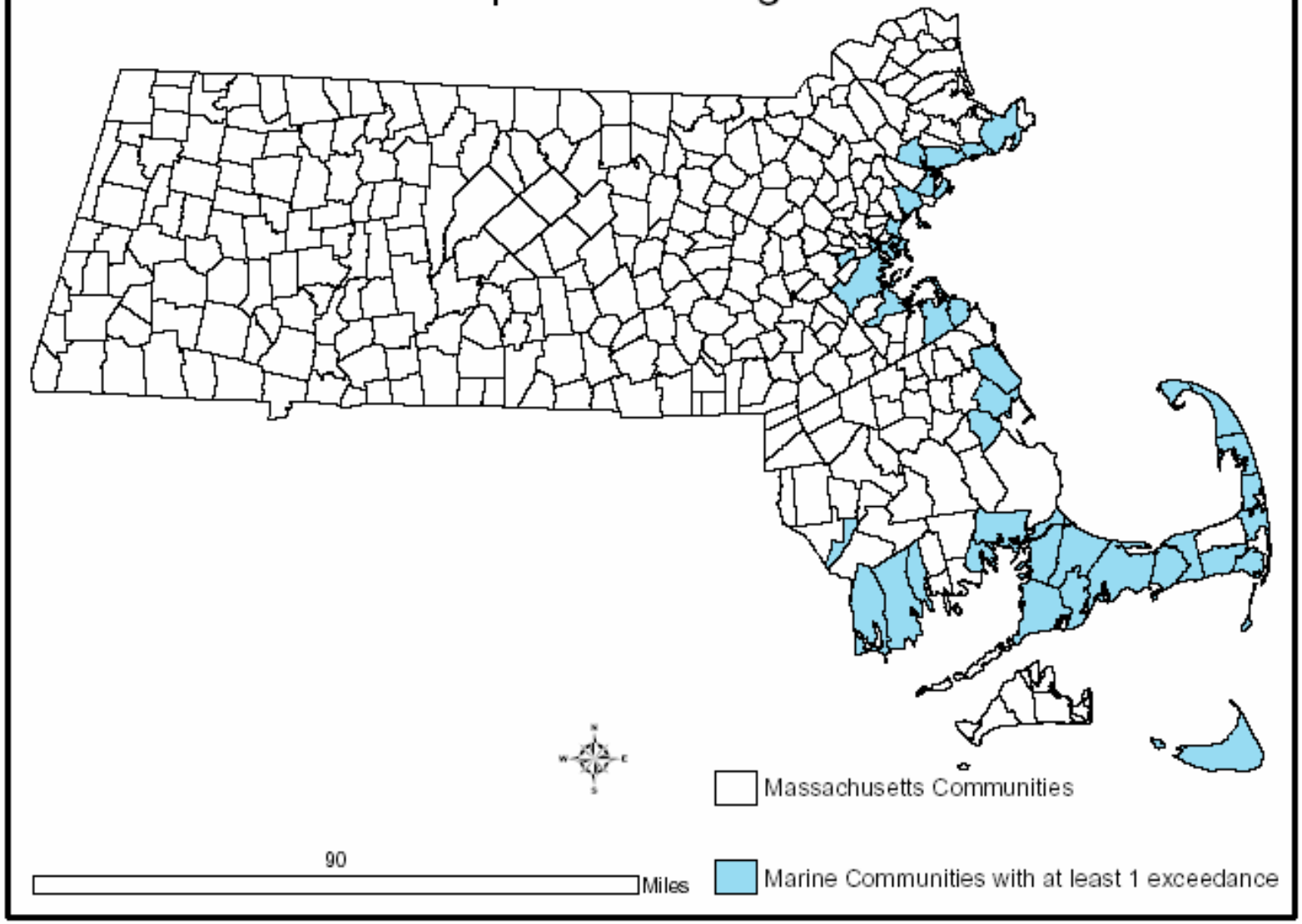


Figure 15. Freshwater beach communities with at least one water sample exceeding criteria in 2004

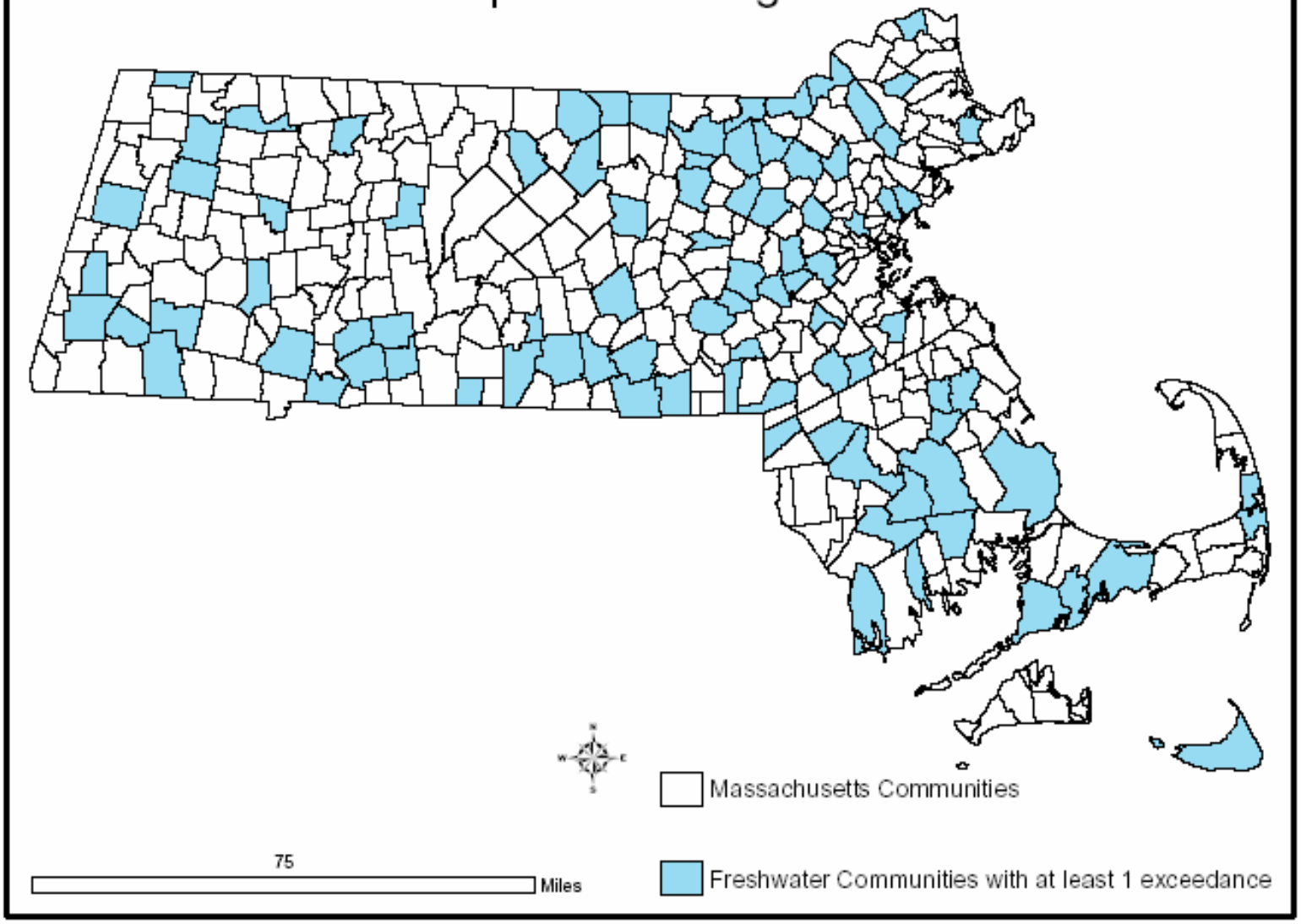


Figure 16
Exceedances and Rainfall Amounts
Marine Beaches
Boston, MA
2004

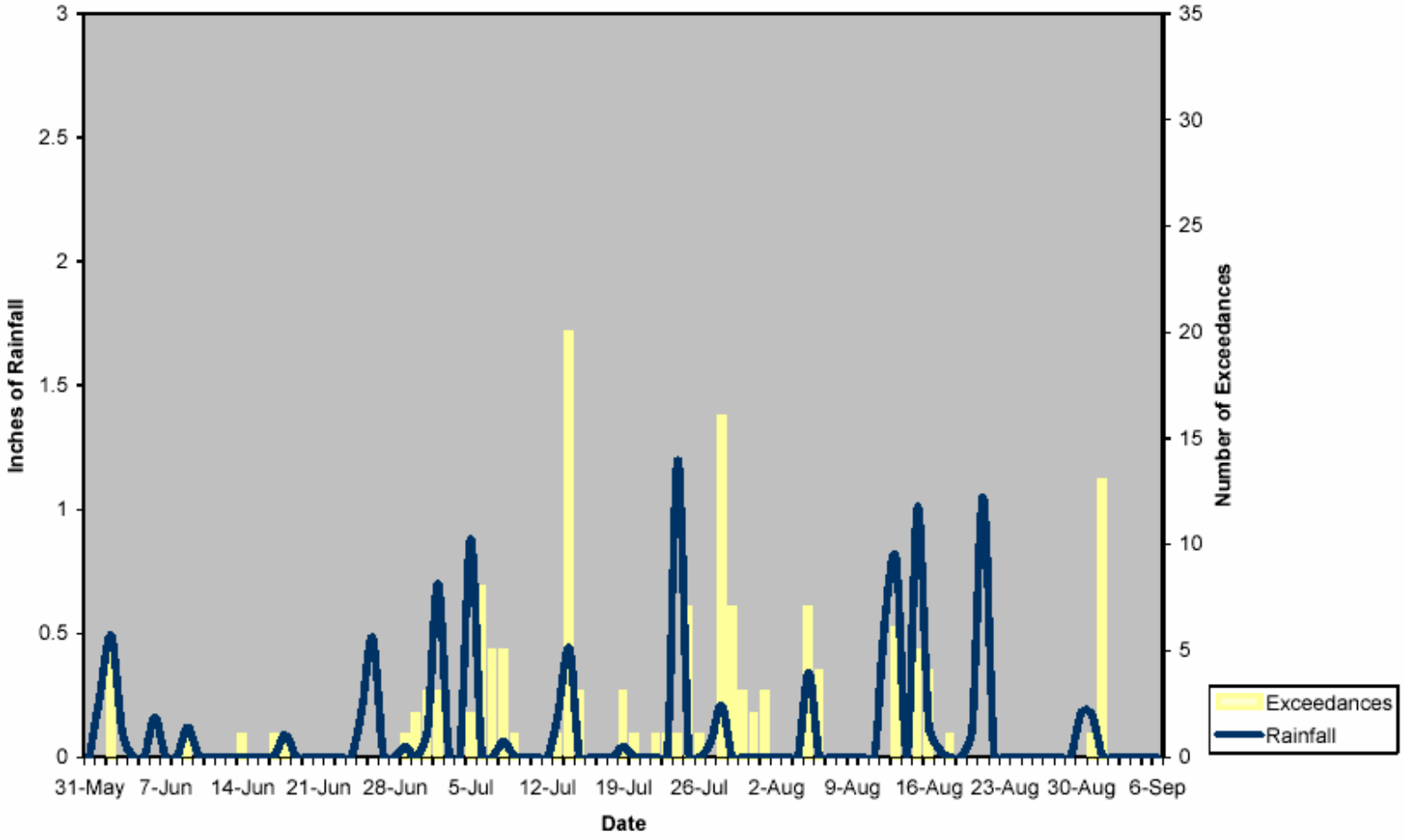


Figure 17
Exceedances and Rainfall Amounts
Marine Beaches
Falmouth, MA
2004

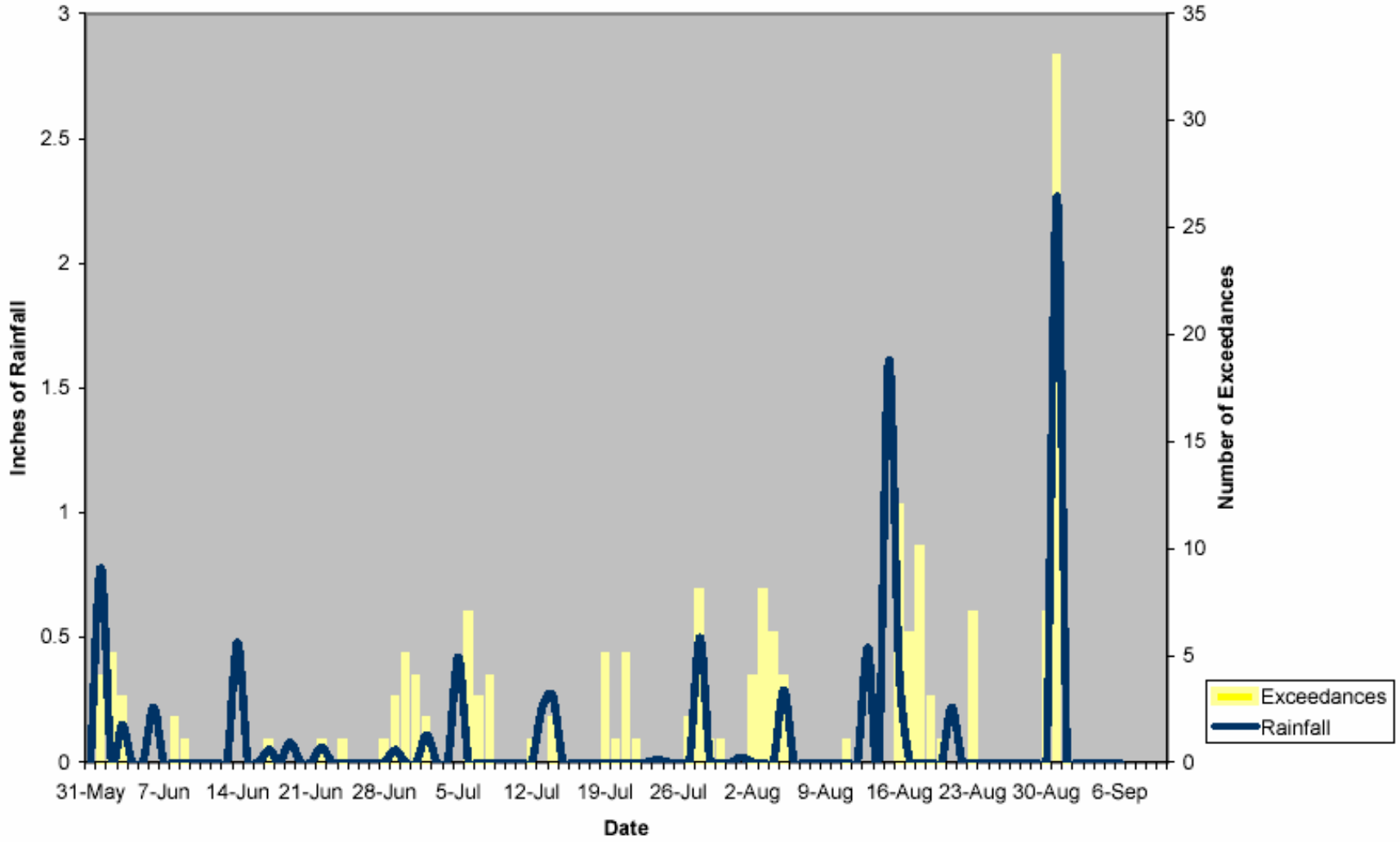


Figure 18
Exceedances and Rainfall Amounts
Freshwater Beaches
Boston, MA
2004

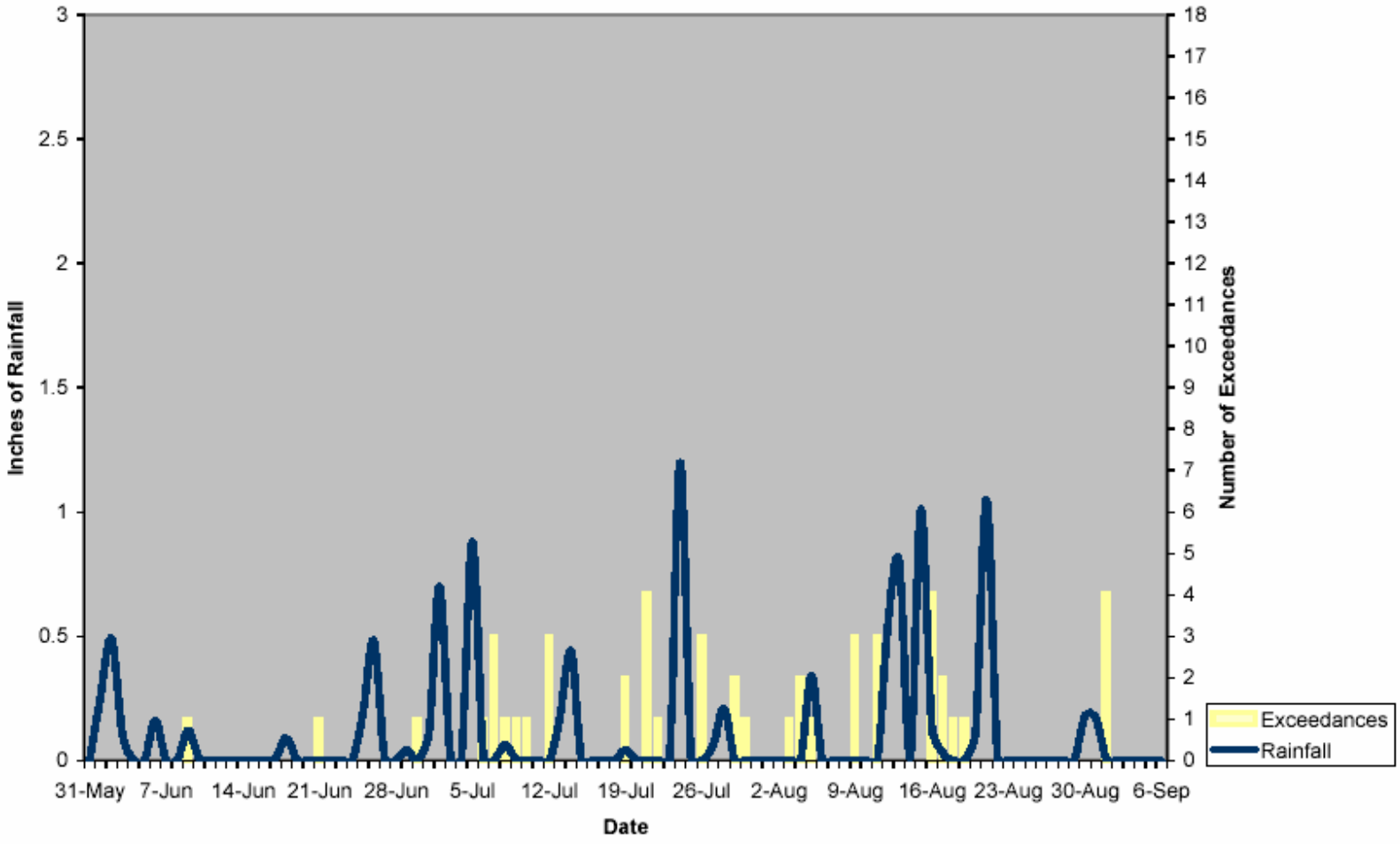


Figure 19
Exceedances and Rainfall Amounts
Freshwater Beaches
Worcester, MA
2004

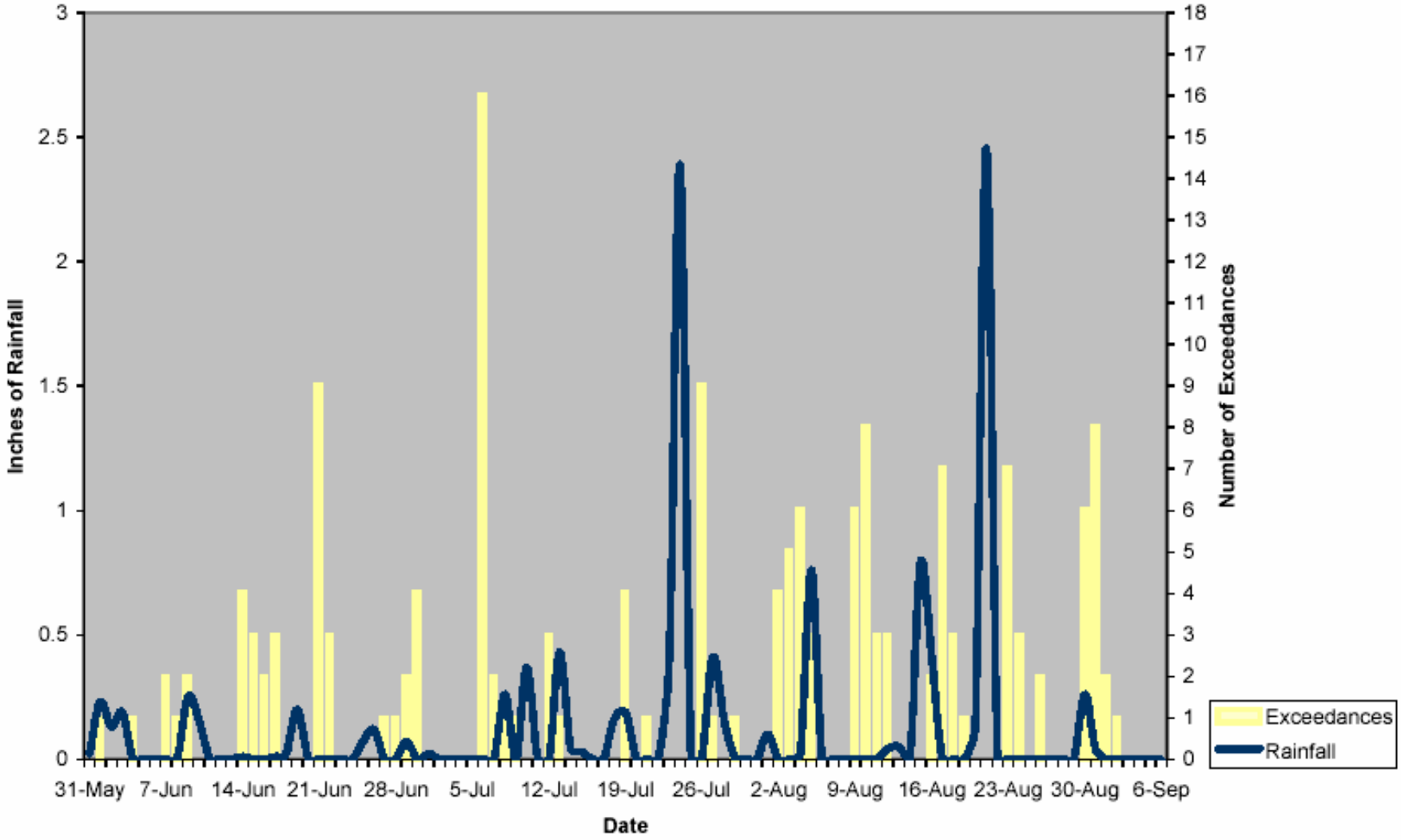


Figure 20
Exceedances and Rainfall Amounts
Freshwater Beaches
Falmouth, MA
2004

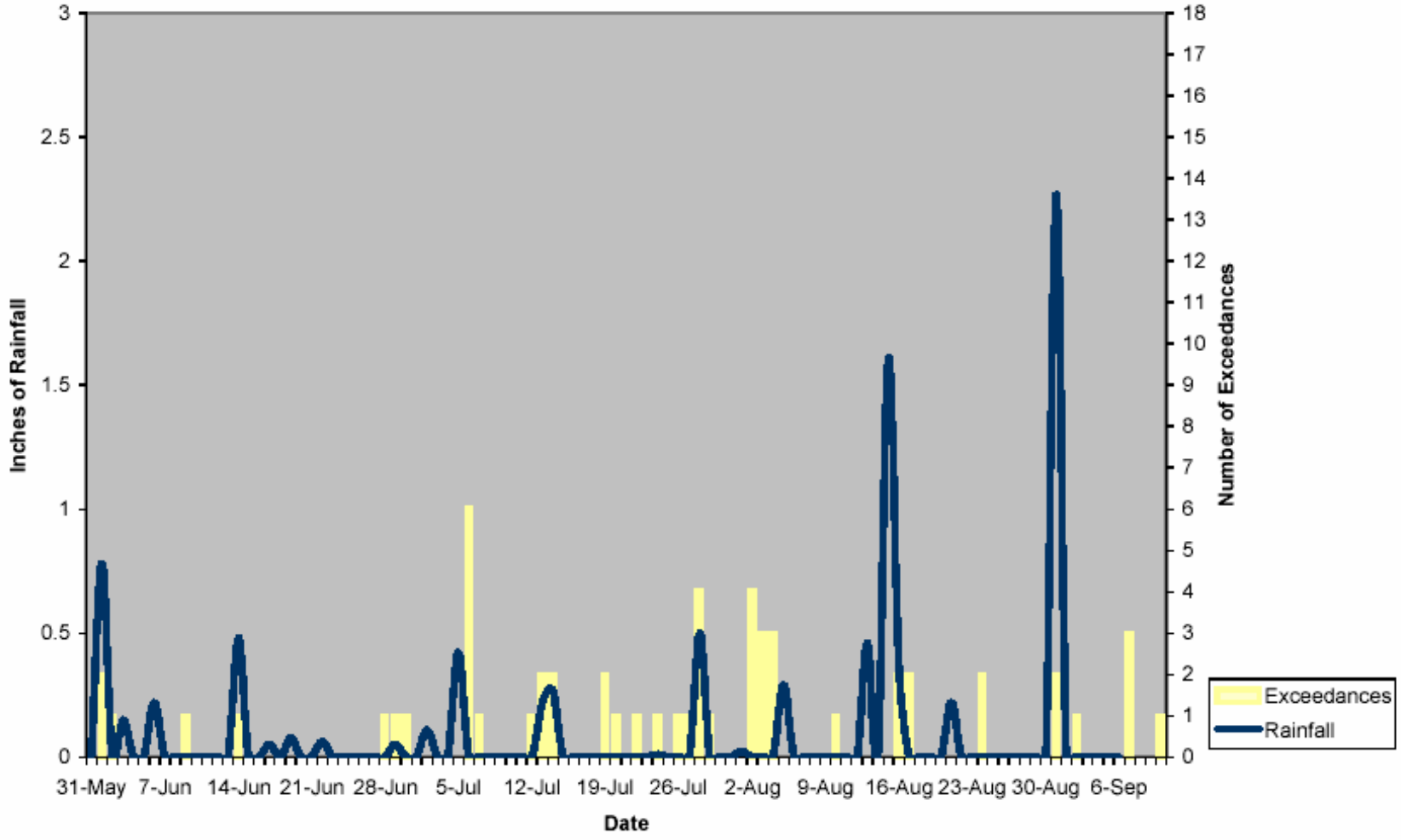


Figure 21

Exceedances Reported Based on the Number of Days Since Last Rainfall at Massachusetts Public and Semi-Public Bathing Beaches During the 2004 Season

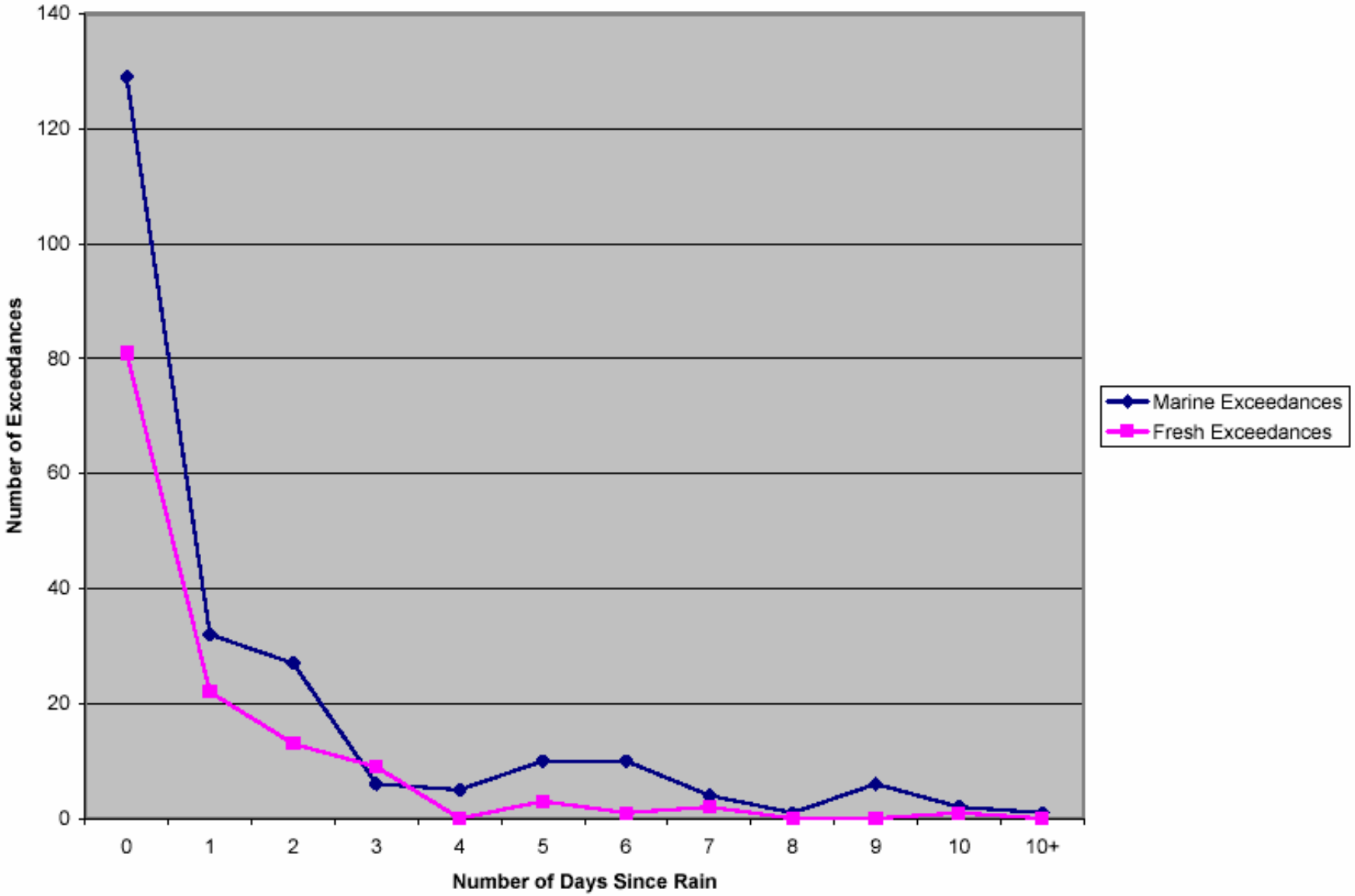


Figure 22
Number of Beach Water Samples Reported to MDPH

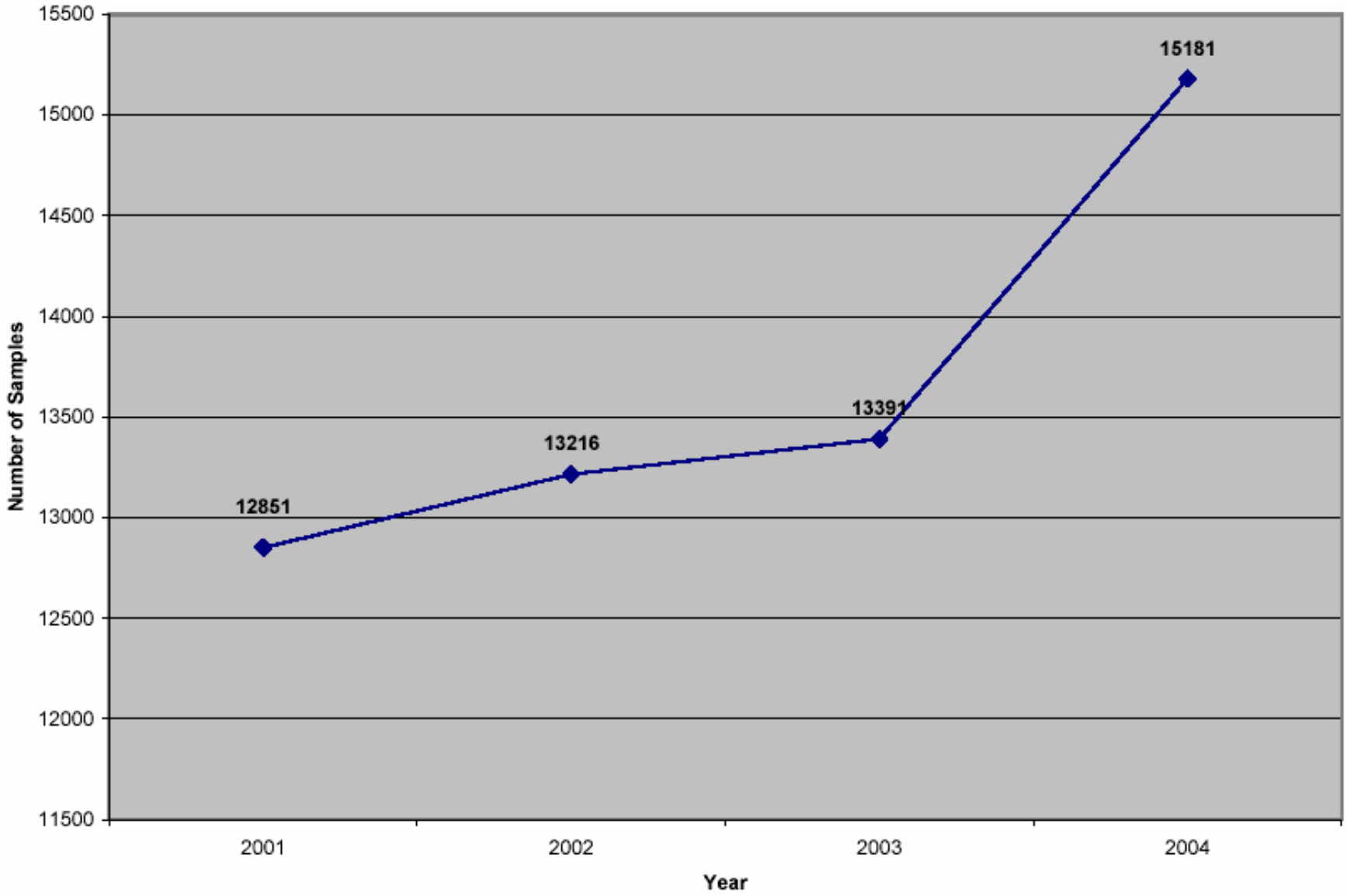


Figure 23
Massachusetts Bathing Beaches that Reported Data to MDPH

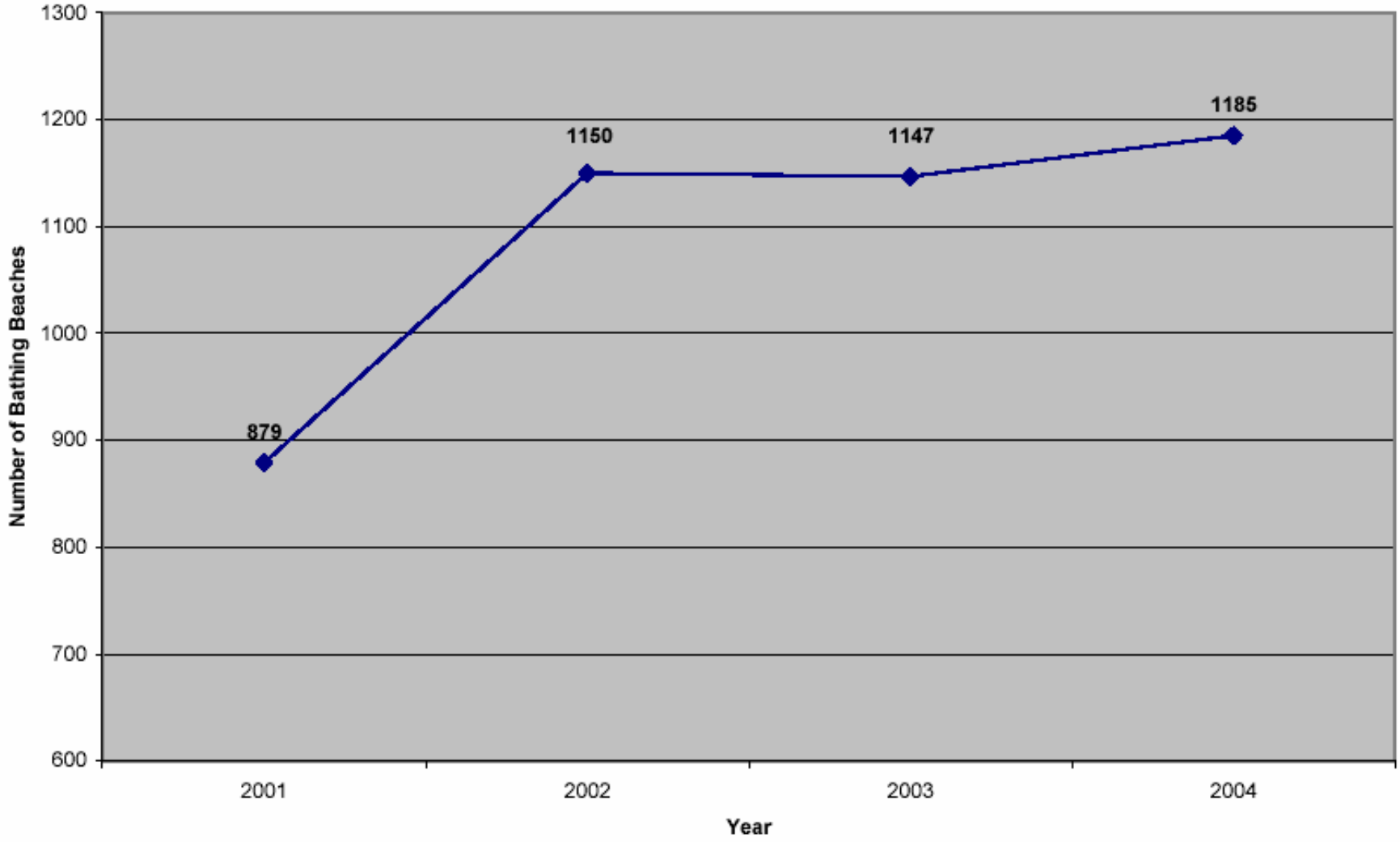


Figure 24
Massachusetts Communities Reporting Beach Data

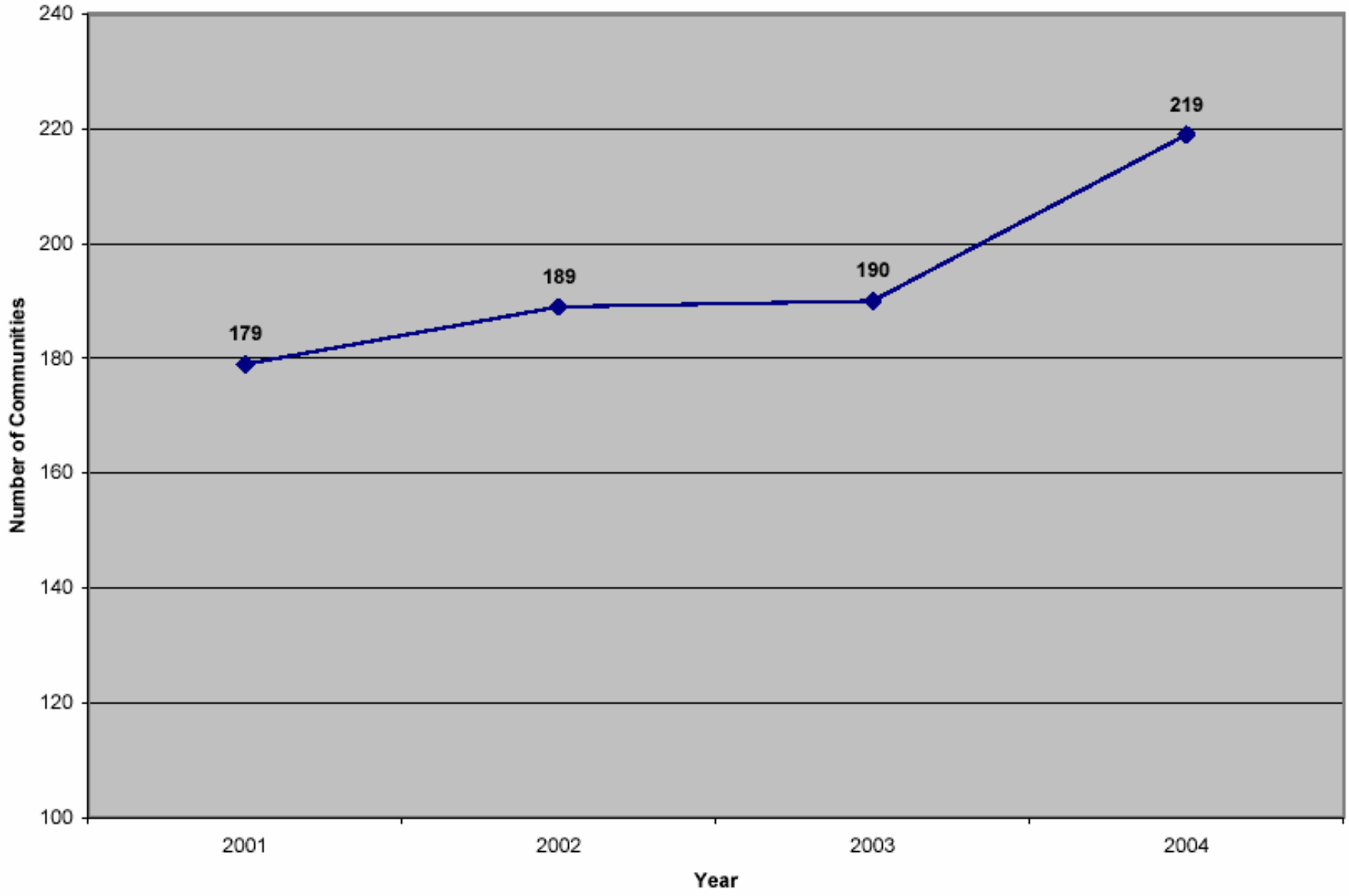


Figure 25: MDPH Public Beach Notification Website: statewide map

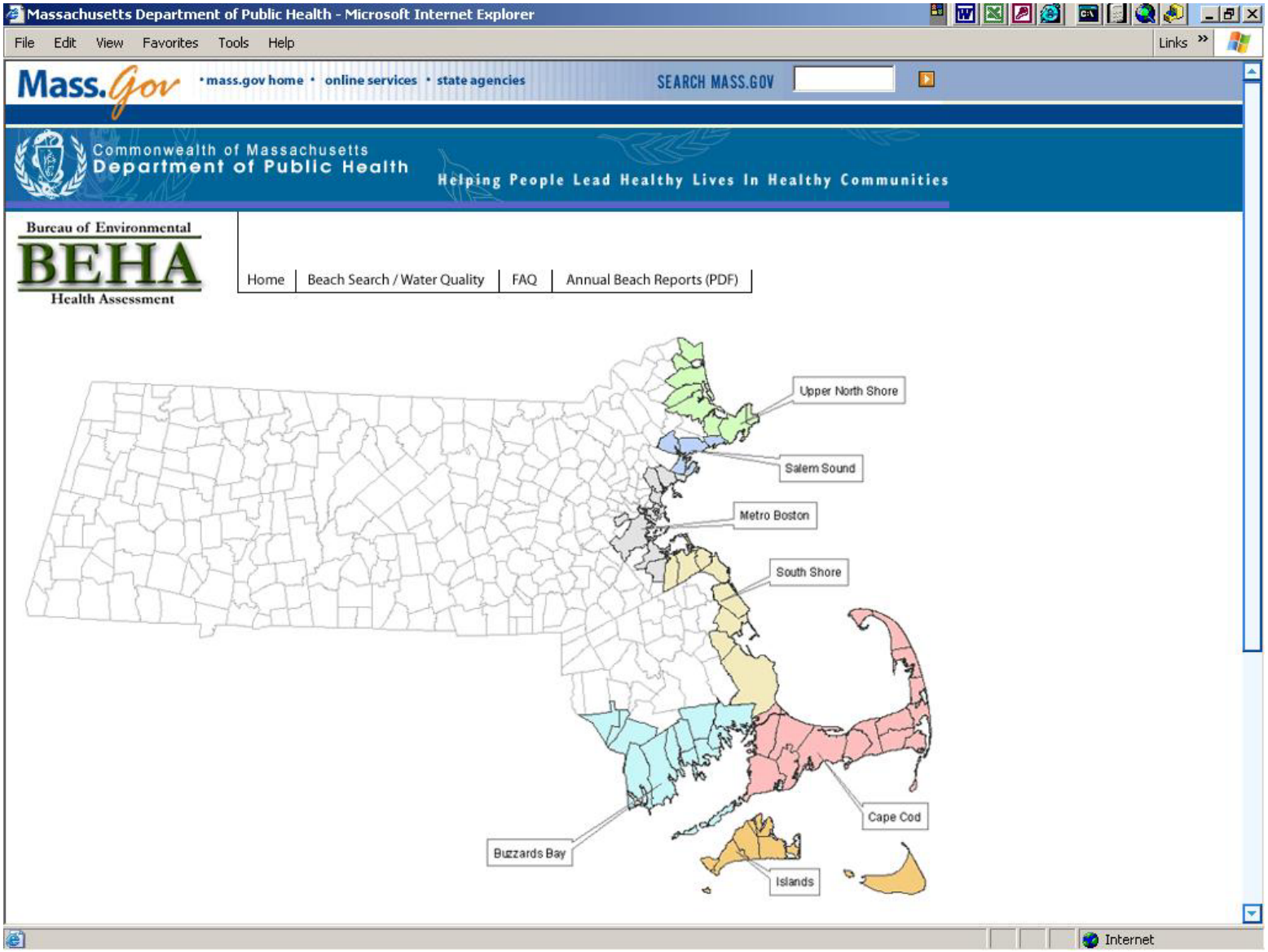


Figure 26: MDPH Public Beach Notification Website: regional map of Cape Cod

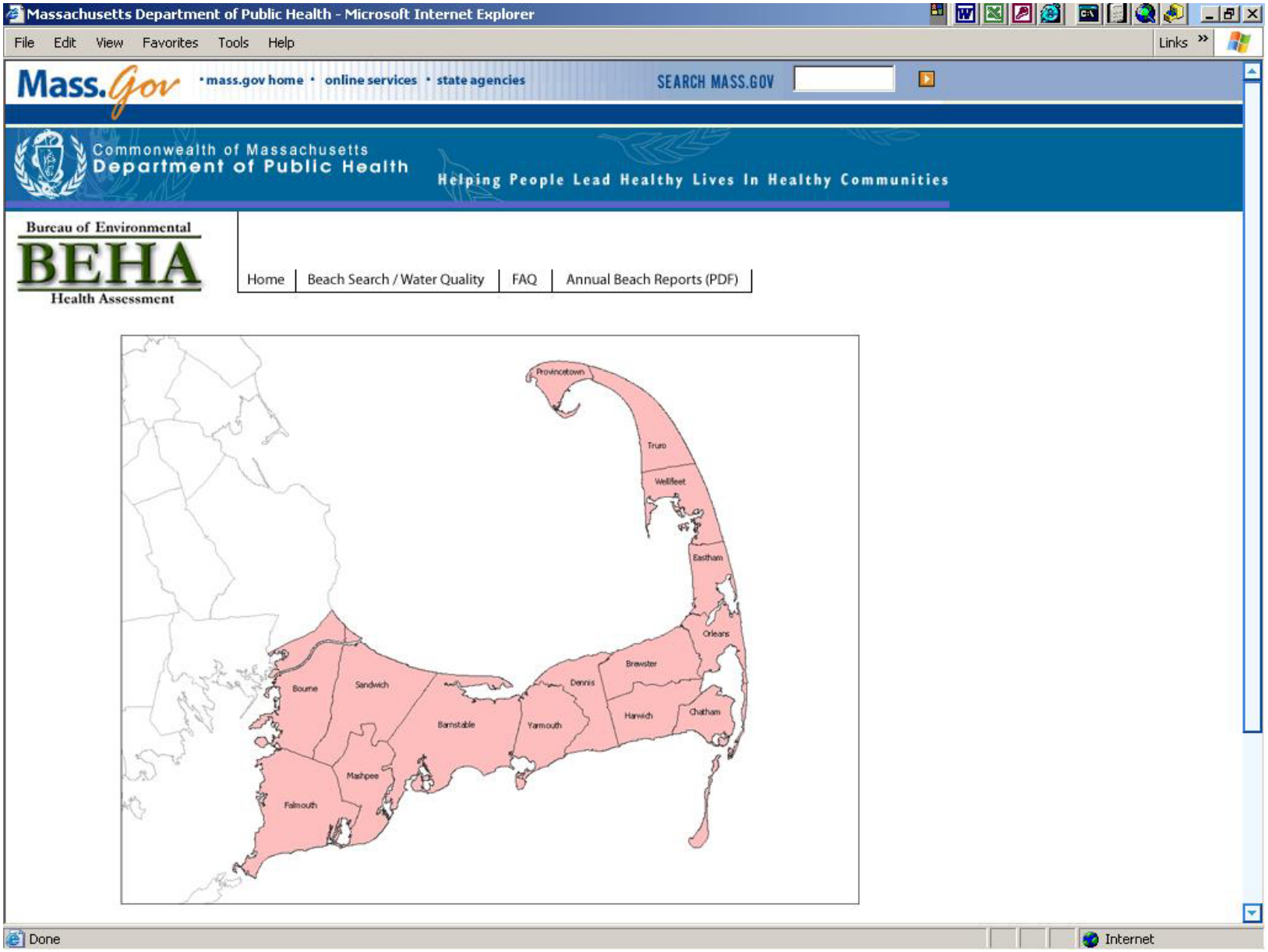
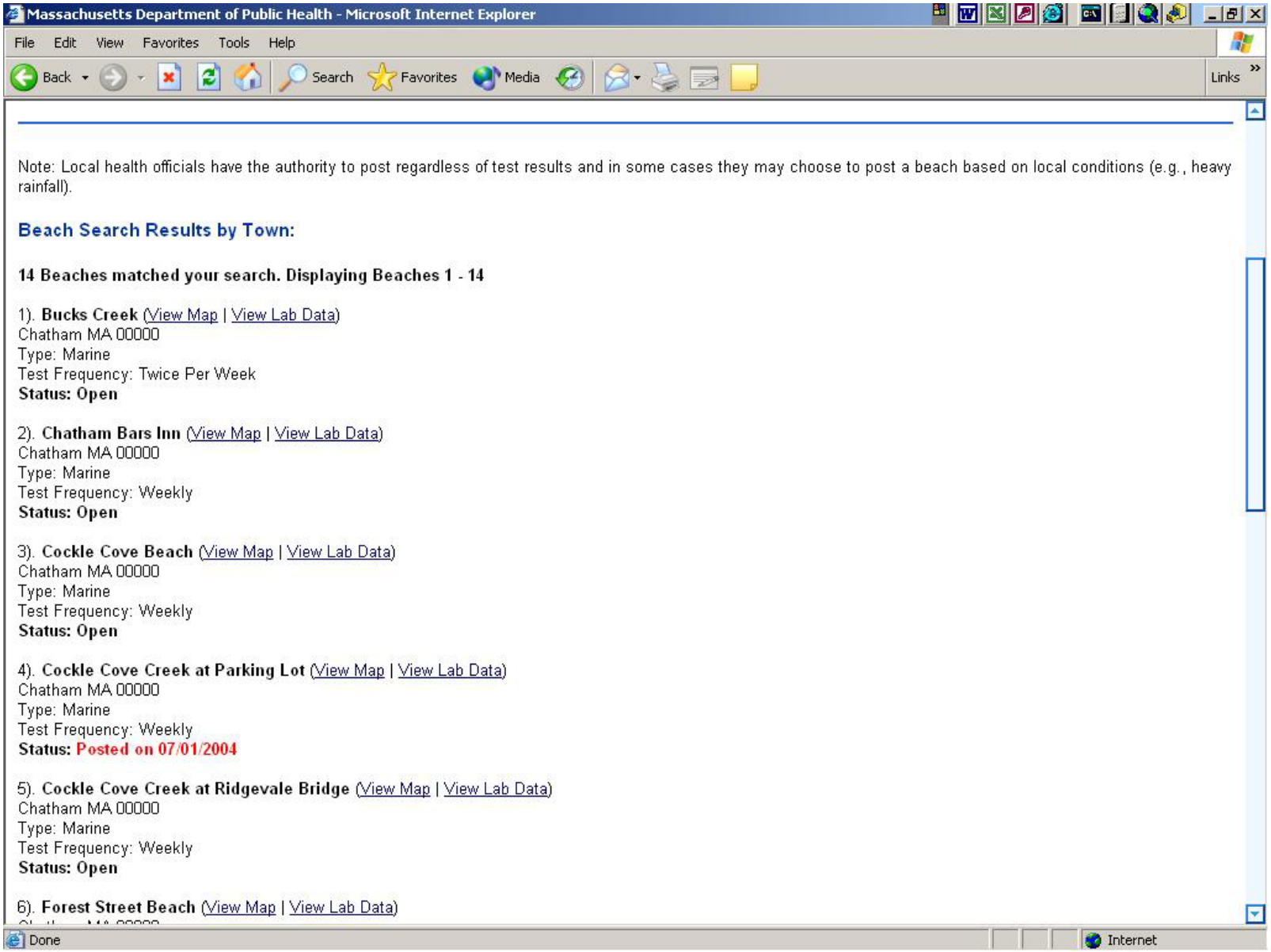


Figure 27: MDPH Public Beach Notification Website: Chatham Beach Posting Data



XI. APPENDICES

- **A. MASSACHUSETTS STATE REGULATIONS**
- **B. GENERAL LAWS OF MASSACHUSETTS**
- **C. MASSACHUSETTS' BEACH ACT**
- **D. FEDERAL BEACH ACT**
- **E. MDPH BEACH SAMPLING FIELD DATA FORM**

APPENDIX A

MASSACHUSETTS STATE REGULATIONS

105 CMR 445.000

MINIMUM STANDARDS FOR BATHING BEACHES
STATE SANITARY CODE, CHAPTER VII

445.001: Purpose

The purpose of 105 CMR 445.000 is to protect the health, safety and well-being of the users of bathing beaches, to establish acceptable standards for the operation of bathing water and to establish a procedure for informing the public of any bathing water closures.

445.002: Authority

105 CMR 445.000 is adopted under the authority of M.G.L. c. 111, ss. 3, 5S and 127A.

445.003: Citation

105 CMR 445.000 shall be known and may be cited as 105 CMR 445.000: *Minimum Standards for Bathing Beaches* (State Sanitary Code, Chapter VII).

445.004: Scope

105 CMR 445.000 shall apply to all public and semi-public bathing beaches.

445.010: Definitions

The words, terms or phrases listed below, for the purpose of 105 CMR 445.000, shall be defined and interpreted as follows:

Bathing Beach means the land where access to the bathing water is provided. It shall not mean a swimming pool as defined in 105 CMR 435.000: Minimum Standards for Swimming Pools (State Sanitary Code, Chapter V).

Bathing Water means fresh or salt water adjacent to any public bathing beach or semipublic bathing beach at the location where it is used for bathing and swimming purposes.

Board of Health means the appropriate and legally designated health authority of the city, town, or other legally constituted governmental unit within the Commonwealth having the usual powers and duties of the board of health of a city or town, or its authorized agent or representative.

Department means the Department of Public Health.

Operator means any person who

(1) alone or jointly or severally with others has legal title to a bathing beach, whether or not that person has legal title or control of the bathing water; or
(2) has care, charge or control of such bathing beach as agent or lessee of the owner or an independent contractor.

Person means any individual or any partnership, corporation, firm, association or group, or the Commonwealth, or any of its agencies, authorities or departments or any political subdivisions of the Commonwealth, including municipalities or other legal entity.

Public Bathing Beach means any bathing beach open to the general public, whether or not any entry fee is charged, that permits access to bathing waters.

Semi-Public Bathing Beach means any bathing beach used in connection with a hotel, motel, a manufactured home park, campground, apartment house, condominium, country club, youth club, school, camp or other similar establishment where the primary purpose of the establishment is not the operation of the bathing beach, and where admission to the use of the bathing beach is included in the fee consideration paid or given for the primary use of the premises. Semi-Public Bathing Beach also means a bathing beach operated solely for the use of members and guests of an organization that maintains such a bathing beach.

Private Bathing Beach means any bathing beach not considered to be a public or semipublic bathing beach.

Sanitary Survey means a written report, conducted by a Massachusetts Registered Sanitary Engineer, Certified Health Officer or Registered Sanitarian, documenting an examination of the bathing water and contiguous land masses for the purpose of identifying actual or potential sources of microbiological or chemical contamination. The sanitary survey shall also include a description of the water circulation associated with the bathing area, the impact of bather load on the bathing beach area and any natural or artificial physical hazards.

445.020: Operation

No operator shall allow bathing or swimming in bathing water whenever in the opinion of the Board of Health or the Department the bathing water is or may be hazardous or unsafe for bathing or swimming. Bathing and swimming at public and semi-public beaches shall be limited to water areas that meet the requirements of 105 CMR 445.030. Any operator of a public or semi-public bathing beach shall comply with the requirements of 105 CMR 445.000.

445.030: Bathing Water Quality

Bathing or swimming shall not be permitted in any bathing water where the quality of the water does not meet the standards established in 105 CMR 445.030(A), 445.030(B), or 445.030(C), and no bathing or swimming shall be allowed when the bathing water is determined by the Board of Health or
the Department to be unfit or so subject to contamination as to constitute a menace to health. Bathing or swimming shall not be permitted in bathing waters when:

(A) Physical Quality.

(1) Sludge deposits, solid refuse, floating waste solids, oils, grease or scum are present; or

(2) There are safety hazards including, but not limited to, fast currents, sharp drop-offs or an unstable bottom in the wading area(s) or lack of water clarity.

(B) Bacteriological Quality.

(1) The results of a sanitary survey or other information indicates that sewage or other hazardous substances may be discharged into the bathing water to a degree

considered by the Board of health or the Department to be of public health significance; or

(2) Epidemiological evidence discloses the prevalence of an infectious disease or other health condition which is considered to be related to the use of the bathing water and is considered by the Board of Health or the Department to be of public health significance; or

(3) The bacteriological quality of the bathing water is unacceptable as determined by laboratory analysis for the appropriate indicator organisms specified in 105 CMR 445.031 and exceeds the standards established therein.

(C) Oil, Hazardous Materials, or Heavy Metals. Oil, hazardous materials, or heavy metals are present in excess of surface water quality standards or guidelines established by the United States Environmental Protection Agency or the Massachusetts Department of Environmental Protection.

445.031: Indicator Organisms

(A) For marine water, the indicator organism shall be Enterococci. No single Enterococci sample shall exceed 104 colonies per 100 ml. and the geometric mean of the most recent five (5) Enterococci levels within the same bathing season shall not exceed 35 colonies per 100 ml.

(B) For fresh water, the indicator organisms shall be E. Coli or Enterococci.

(1) No single E. Coli sample shall exceed 235 colonies per 100 ml. and the geometric mean of the most recent five E. Coli samples within the same bathing season shall not exceed 126 colonies per 100 ml; or

(2) No single Enterococci sample shall exceed 61 colonies per 100 ml. and the geometric mean of the most recent five (5) Enterococci samples within the same bathing season shall not exceed 33 colonies per 100 ml.

445.032: Collection of Bathing Water Samples

(A) Location. The Board of Health, for public and semi-public bathing beaches that are not operated by the Commonwealth, and the Department, for bathing beaches that are operated by the Commonwealth, shall approve sampling locations at each bathing beach in its jurisdiction. Samples of bathing water shall be taken at locations within areas of greatest bather load. Additional samples shall also be obtained at any critical location subject to contamination from business developments, dwellings, streams, sewer outfall pipes or other sources. All required samples shall be obtained from these designated locations.

(B) Sample Collection. Samples shall be obtained in accordance with the procedures recommended by the most recent edition of the Standard Methods for the Examination of Water and Waste Water of the American Public Health Association or as approved by the United States Environmental Protection Agency.

(C) Frequency.

(1) The Board of Health, its agent, or any other authorized person shall collect the bacteriologic samples:

(a) Within five days of the opening of the bathing season; and

(b) At least weekly during the bathing season at a time and day approved by the Board of Health or the Department; and

(c) Prior to reopening a beach after closing for any reason.

(2) Testing for oil, hazardous materials, or heavy metals shall only be required if the operator, the Board of Health, or the Department has information indicating possible contamination of the bathing beach or bathing waters from oil, hazardous materials or heavy metals.

(D) Field Data. Physical conditions noted at the time of sampling shall be recorded on a form provided by the Department

(E) Personnel. Samples shall be taken by the Board of Health, the Department, their duly authorized representatives or other qualified persons as determined by the Board of Health or the Department.

445.033: Laboratory Analysis and Reporting

(A) Laboratory Analysis. Laboratory analysis of bathing water as required by 105 CMR 445.000 shall be conducted in accordance with the most recent edition of the Standard Methods for Examination of Water and Waste Water of the American Public Health Association or as approved by the United States Environmental Protection Agency.

(B) Reporting.

(1) Routine Reporting by Operators. Any operator or authorized agent of a public bathing beach, except public bathing beaches operated by the Commonwealth, and any operator or authorized agent of a semi-public bathing beach shall report the certified results of all testing, monitoring and analysis of bathing water to the Board of Health within five (5) days of receipt of the results from the laboratory.

(2) Reporting by Operators of Levels Exceeding the Established Standards. Any operator or authorized agent of a public or semi-public bathing beach shall immediately report to the Board of Health the results of all testing, monitoring and analysis of bathing water found to exceed the standards established in 105 CMR 445.030.

(3) Reporting by the Board of Health. The Board of Health or its authorized agent shall report the results of all testing, monitoring and analysis of bathing water to the Department no later than October 31 of each year.

445.034: Bathing Beaches Operated by the Commonwealth

State agencies that own or operate a bathing beach shall conduct or cause to be conducted all testing, monitoring, and analysis of bathing water at such bathing beach in accordance with these regulations. If the results of such testing, monitoring and analysis are found to exceed the standards established in 105 CMR 445.030, state agencies shall immediately, and in no event later than 24 hours, report the results of such testing, monitoring and analysis to the Department and the Board of Health in the city or town where the bathing beach is located. All other results shall be reported to the Department no later than October 31 of each year.

445.035: Sampling and Analysis at Semi-Public Beaches

(A) The operators of semi-public bathing beaches shall pay for the costs of testing, monitoring and analysis of bathing waters adjacent to such semi-public bathing beaches.

(B) Operators of semi-public bathing beaches may enter into contractual agreements with the Board of Health to have the testing, monitoring and analysis of bathing water conducted by the Board of Health, the Department or other qualified persons as determined by the Board of Health or the Department.

445.036: Public Request for Testing

Any person may request that the Board of Health, or in the case of a bathing beach operated by the Commonwealth, the state agency or the Department, conduct testing, monitoring, and analysis of public and semi-public bathing waters when there is reasonable basis to believe that an alleged violation of 105 CMR 445.000 has occurred. The Board of Health or the Department, as appropriate, shall promptly review such requests and determine whether any such testing, monitoring, and analysis is necessary to ensure the public health and safety of bathing waters.

445.040: Posting and Reopening Notifications

(A) Posting. Whenever the bathing water quality does not meet the requirements of 105 CMR 445.030 or after any significant rainstorm at a bathing beach where there has been a history of violations of the water quality requirements contained in 105 CMR 445.030, the Board of Health, its agent, or any other authorized person shall immediately, and in no event later than 24 hours, notify the Department, and post or cause to be posted, a sign, or signs, at the entrance to each parking lot and each entrance to the beach stating:

WARNING! NO SWIMMING
SWIMMING MAY CAUSE ILLNESS

and a graphic depiction of a swimmer in a red circle with a diagonal hatch mark. The sign shall also contain the reason for the warning, the date of the posting and the name and telephone number of the board of health.

(B) Reopening. Prior to reopening bathing water posted due to a violation of the standards established in 105 CMR 445.030, the Board of Health, its agent, or any other authorized person shall verify that the certified results of the laboratory analysis are less than the standard specified in 105 CMR 445.031. The operator of any state operated bathing beach shall notify the Department and the Board of Health within 24 hours, or the next business day, of the reopening of the bathing water.

445.100: Variance

(A) The Board of Health may grant a variance from the provisions of 105 CMR 445.000 for any public or semi-public bathing beach not operated by the Commonwealth. The Department may grant a variance for any bathing beach operated by the Commonwealth. In granting a variance, the Board of Health and the Department shall review available epidemiological data and a written sanitary survey of the bathing beach, as provided by the operator. The survey shall include:
(1) All possible sources of contamination, both bacterial and chemical on the watershed tributary to the bathing beach including the location and volume of:
(a) sewage and industrial waste water discharges;
(b) storm water overflows;
(c) bird and animal populations; and
(d) commercial and agricultural drainage.
(2) The volume and quality of the diluting water, water depth, water surface area, tides and confluence of tributaries, water currents and prevailing winds.

(B) Any variance granted by the Board of Health shall specify the required

bacteriological testing schedule, provided that the frequency of bacteriological testing shall not be less than once prior to the bathing season and at least every 30 days thereafter throughout the duration of the bathing season.

(C) Any variance granted by a Board of Health or the Department shall expire*:*
(1) at any time as determined by the Board of Health, but in no instance greater than four years, at which time the operator may apply for an extension, or
(2) at any time the results of bacterial test exceed the levels at 105 CMR 445.031.

(D) No variance from the requirement of weekly testing shall be granted until the applicant provides the Board of Health or the Department with water quality data collected for at least two complete and consecutive bathing seasons.

(E) In granting a variance, the Board of Health or the Department must determine that the enforcement of 105 CMR 445.000 would not serve a significant public health purpose and that the granting of the variance will not conflict with the intent and spirit of these minimum standards. Any variance or other modification authorized to be made by these regulations may be subject to such qualification, revocation, suspension, or other expiration as the Board of Health or the Department expresses in its grant. A variance or other modification authorized to be made by this regulation may otherwise be revoked, modified, or suspended in whole or in part, only after the holder thereof has been notified in writing and has been given the opportunity to be heard.

445.101: Variance to be in Writing

(A)Any variance granted by the Board of Health or the Department shall be in writing. Any denial for a variance shall also be in writing and shall contain a brief statement of the reasons for denial. A copy of each variance shall be conspicuously posted for 30 days following its issuance and shall, while it is in effect, be available to the public at all reasonable hours in the office of the clerk of the city or town, or in the office of the Board of Health and in the case of a variance by the Department, at the Department.

(B) The Board of Health shall submit to the Department a notice of the intent to grant a variance. The Department shall approve, disapprove, or modify the variance within 45 days from receipt thereof. If the Department fails to comment within 45 days, its approval shall be presumed. No alteration of any requirement in these regulations shall be made under any variance until the Department approves it or 45 days has elapsed without comment, unless the Board of Health certifies in writing to the Department that an emergency exists.

445.300: Severability

In the event that any section of 105 CMR 445.000 is found to be invalid or unconstitutional, the remaining sections shall not be affected and shall remain in full force and effect. To this end, the provisions of this regulation are hereby declared severable.

APPENDIX B

GENERAL LAWS OF MASSACHUSETTS

B. GENERAL LAWS OF MASSACHUSETTS

PART I.
ADMINISTRATION OF THE GOVERNMENT

TITLE XVI.
PUBLIC HEALTH

CHAPTER 111. PUBLIC HEALTH

DUTIES OF THE DEPARTMENT OF PUBLIC HEALTH
Chapter 111: Section 5S Public bathing waters; minimum sanitation standards; testing, monitoring and analysis; regulations

Section 5S. (a) As used in this section, the following words shall have the following meanings:--

""Bathing water", fresh or salt water adjacent to any public bathing beach or semi-public bathing beach in the commonwealth.

""Department", the department of public health.

""Public bathing beach", a beach open to the general public, whether or not an entry fee is charged, that permits access to bathing waters.

""Semi-public bathing beach", a bathing beach used in connection with a hotel, motel, trailer park, campground, apartment house, condominium, country club, youth club, school, camp or similar establishment where the primary purpose of the establishment is not the operation of the bathing beach, and where admission to the use of the bathing beach is included in the fee paid for use of the premises. A semi-public bathing beach shall also include a bathing beach operated and maintained solely for the use of members and guests of an organization that maintains such a bathing beach.

(b) The department, in consultation with local health officers, shall establish minimum sanitation standards to protect bathing waters from contamination from the following: (1) sludge deposits and solid refuse; (2) floating solid, grease or scum wastes; (3) oil, hazardous material, and heavy metals; and (4) bacteria, including but not limited to, total coliform, fecal coliform and enterococci bacteria.

(c) Such standards shall establish safe levels of human exposure to such contaminants, and shall further incorporate, at a minimum, the following provisions:--

(1) An officer or an agent of a local board of health shall test, monitor and analyze all bathing waters within its municipality. Every local board of health shall report the results from all testing, monitoring and analysis of bathing waters to the department. The department shall establish such reporting requirements and shall keep public

records thereof. The department shall issue an annual report on the state of beach water quality using data that has been reported to the department. The department shall make such data available to the public upon written request.

(2) The department shall determine at which sites to conduct testing and monitoring of bathing waters. The department shall consider, but not be limited to, the following factors in determining at which sites to conduct testing and monitoring of bathing waters: (i) prior testing results pursuant to this section for such bathing waters; (ii) the number of people who use the bathing beach annually; and (iii) whether the beach is located adjacent to a storm water drain, sewage, industrial and commercial wastewater discharges, or commercial, industrial and agricultural drains.

(d) The department shall determine at what frequency to conduct testing, monitoring and analysis of bathing waters. Testing, monitoring and analysis shall be conducted on at least a weekly basis during the bathing season, and at such times and under such conditions as shall be sufficient to protect public health and safety. The department may grant a variance from the weekly testing requirement for a public or semi-public bathing beach only where there is a documented history of no sources of pollution, both point and non-point, at the bathing beach, or where such pollution sources at the beach have been fully and completely remediated.

(e) The department shall require the posting of conspicuous warning signs to notify the public whenever there is a threat to human health or safety in bathing waters. Signs shall be posted at locations on the beach that are visible to the public in order to inform the public of the nature of the problem and the possibility of a threat to human health and safety. Signs shall be posted immediately after significant rainstorms at bathing beach locations where there has been a chronic history of violations of the department's minimum sanitation standards for bathing beaches after such rainstorms. When an officer or agent of a local board of health discovers a violation of such minimum sanitation standards, the officer or agent shall notify the department immediately, and in no event not later than 24 hours after such discovery. The local board of health shall also post signs immediately, and in no event not later than 24 hours after such a discovery.

(f) A person may request that a local board of health conduct testing, monitoring and analysis of bathing waters when there is a reasonable basis to believe that an alleged violation of such minimum sanitation standards established by this section has occurred. Local boards of health shall promptly review such requests and determine whether any such testing, monitoring and analysis is necessary to ensure the public health and safety in bathing waters.

(g) The owners of semi-public bathing beaches shall be required to pay for the costs of testing, monitoring and analysis of bathing waters adjacent to such semi-public bathing beaches.

(h) Local boards of health may enter into contractual agreements with owners of semi-public bathing beaches where the local board of health conducts testing, monitoring and analysis of such bathing waters.

(i) A municipality or state agency may adopt sanitation standards and testing, monitoring, and analysis requirements for bathing waters within its jurisdiction that are stricter than the standards adopted by the department. In any case where a municipality or state agency adopts such stricter standards, any warning signs required by this section shall display the results of such stricter standards relative to the standards of the department.

(j) The testing, monitoring and analysis of bathing waters that are under the control of any state agency shall be conducted by that state agency. All such state agencies shall meet the requirements set forth by this section and the regulations promulgated by the department.

(k) The department may, subject to appropriation, award competitive grants to local boards of health in the form of a 50 per cent reimbursement for the testing, monitoring and analysis of bathing waters and to otherwise carry out the provisions of this section and the regulations promulgated thereunder. The department shall enter into a contractual agreement with a sole provider of testing services to be utilized by any state agency, and which may be utilized by any local board of health, to comply with the provisions of this section.

The department shall also ensure that the provisions of this section and the regulations promulgated thereunder are implemented in a cost effective manner by encouraging, where possible, regional approaches or other cost effective means of carrying out the purposes of this section.

(l) The department shall enforce the provisions of this section in accordance with the penalty and enforcement provisions of section 127A.

APPENDIX C

MASSACHUSETTS' BEACH ACT

C. CHAPTER 248 OF THE ACTS OF 2000

1. AN ACT RELATIVE TO MINIMUM STANDARDS FOR PUBLIC BATHING WATERS.

Be it enacted by the Senate and House of Representatives in General Court assembled, and by the authority of the same, as follows:

SECTION 1. Chapter 111 of the General Laws is hereby amended by inserting after section 5R the following section:-

Section 5S. (a) As used in this section, the following words shall have the following meanings:-

"Bathing water", fresh or salt water adjacent to any public bathing beach or semi-public bathing beach in the commonwealth.

"Department", the department of public health.

"Public bathing beach", a beach open to the general public, whether or not an entry fee is charged, that permits access to bathing waters.

"Semi-public bathing beach", a bathing beach used in connection with a hotel, motel, trailer park, campground, apartment house, condominium, country club, youth club, school, camp or similar establishment where the primary purpose of the establishment is not the operation of the bathing beach, and where admission to the use of the bathing beach is included in the fee paid for use of the premises. A semi-public bathing beach shall also include a bathing beach operated and maintained solely for the use of members and guests of an organization that maintains such a bathing beach.

(b) The department, in consultation with local health officers, shall establish minimum sanitation standards to protect bathing waters from contamination from the following: (1) sludge deposits and solid refuse; (2) floating solid, grease or scum wastes; (3) oil, hazardous material, and heavy metals; and (4) bacteria, including but not limited to, total coliform, fecal coliform and enterococci bacteria.

(c) Such standards shall establish safe levels of human exposure to such contaminants, and shall further incorporate, at a minimum, the following provisions:-

(1) An officer or an agent of a local board of health shall test, monitor and analyze all bathing waters within its municipality. Every local board of health shall report the results from all testing, monitoring and analysis of bathing waters to the department. The department shall establish such reporting requirements and shall keep public records thereof. The department shall issue an annual report on the state of beach

water quality using data that has been reported to the department. The department shall make such data available to the public upon written request.

(2) The department shall determine at which sites to conduct testing and monitoring of bathing waters. The department shall consider, but not be limited to, the following factors in determining at which sites to conduct testing and monitoring of bathing waters: (i) prior testing results pursuant to this section for such bathing waters; (ii) the number of people who use the bathing beach annually; and (iii) whether the beach is located adjacent to a storm water drain, sewage, industrial and commercial wastewater discharges, or commercial, industrial and agricultural drains.

(d) The department shall determine at what frequency to conduct testing, monitoring and analysis of bathing waters. Testing, monitoring and analysis shall be conducted on at least a weekly basis during the bathing season, and at such times and under such conditions as shall be sufficient to protect public health and safety. The department may grant a variance from the weekly testing requirement for a public or semi-public bathing beach only where there is a documented history of no sources of pollution, both point and non-point, at the bathing beach, or where such pollution sources at the beach have been fully and completely remediated.

(e) The department shall require the posting of conspicuous warning signs to notify the public whenever there is a threat to human health or safety in bathing waters. Signs shall be posted at locations on the beach that are visible to the public in order to inform the public of the nature of the problem and the possibility of a threat to human health and safety. Signs shall be posted immediately after significant rainstorms at bathing beach locations where there has been a chronic history of violations of the department's minimum sanitation standards for bathing beaches after such rainstorms. When an officer or agent of a local board of health discovers a violation of such minimum sanitation standards, the officer or agent shall notify the department immediately, and in no event not later than 24 hours after such discovery. The local board of health shall also post signs immediately, and in no event not later than 24 hours after such a discovery.

(f) A person may request that a local board of health conduct testing, monitoring and analysis of bathing waters when there is a reasonable basis to believe that an alleged violation of such minimum sanitation standards established by this section has occurred. Local boards of health shall promptly review such requests and determine whether any such testing, monitoring and analysis is necessary to ensure the public health and safety in bathing waters.

(g) The owners of semi-public bathing beaches shall be required to pay for the costs of testing, monitoring and analysis of bathing waters adjacent to such semi-public bathing beaches.

(h) Local boards of health may enter into contractual agreements with owners of semi-public bathing beaches where the local board of health conducts testing, monitoring and analysis of such bathing waters.

(i) A municipality or state agency may adopt sanitation standards and testing, monitoring, and analysis requirements for bathing waters within its jurisdiction that are stricter than the standards adopted by the department. In any case where a municipality or state agency adopts such stricter standards, any warning signs required by this section shall display the results of such stricter standards relative to the standards of the department.

(j) The testing, monitoring and analysis of bathing waters that are under the control of any state agency shall be conducted by that state agency. All such state agencies shall meet the requirements set forth by this section and the regulations promulgated by the department.

(k) The department may, subject to appropriation, award competitive grants to local boards of health in the form of a 50 per cent reimbursement for the testing, monitoring and analysis of bathing waters and to otherwise carry out the provisions of this section and the regulations promulgated thereunder. The department shall enter into a contractual agreement with a sole provider of testing services to be utilized by any state agency, and which may be utilized by any local board of health, to comply with the provisions of this section.
The department shall also ensure that the provisions of this section and the regulations promulgated thereunder are implemented in a cost effective manner by encouraging, where possible, regional approaches or other cost effective means of carrying out the purposes of this section.

(l) The department shall enforce the provisions of this section in accordance with the penalty and enforcement provisions of section 127A.

SECTION 2. The department of public health shall promulgate the regulations required by section 5S of chapter 111 of the General Laws not later than March 1, 2001.

SECTION 3. The division of local mandates, in the office of the state auditor, through the legislative review program, pursuant to the last paragraph of section 6B of chapter 11 of the General Laws, shall make a comprehensive report on sections 1 and 2 of this act. The report shall determine the financial impact on cities and towns of such sections and shall prepare a preliminary cost study and cost benefit analysis. The report shall be filed with the clerk of the house of representatives not later than December 1, 2000.

SECTION 4. Sections 1 and 2 of this act shall take effect on February 1, 2001.

Approved August 11, 2000.

APPENDIX D

FEDERAL BEACH ACT

PUBLIC LAW 106-284 - 0CT. 10, 2000

BEACHES ENVIRONMENTAL ASSESSMENT AND COASTAL HEALTH ACT OF 2000

Public Law 106-284
106th Congress

1. An Act

Oct 10, 2000

[H.R.999]

To amend the Federal Water Pollution Control Act to improve the quality of coastal recreation waters, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

Beaches Environmental Assessment and Coastal Health Act of 2000. lnter-governmental relations. Public health and Safety. 33 USC 1251 note.

SECTION I. SHORT TITLE.

This Act may be cited as the "Beaches Environmental Assessment and Coastal Health Act of 2000".

SEC. 2. ADOPTION OF COASTAL RECREATION WATER QUALITY CR1TERIA AND STANDARDS BY STATES.

Section 303 of the Federal Water Pollution Control Act (33 U.S.C. 1313) is amended by adding at the end the following:

"(i) COASTAL RECREATION WATER QUALITY CRITERIA.-

"(1) ADOPTION BY STATES.-

"(A) INITIAL CRITERIA AND STANDARDS.-Not later than 42 months after the date of the enactment of this sub- section, each State having coastal recreation waters shall adopt and submit to the Administrator water quality criteria and standards for the coastal recreation waters of the State for those pathogens and pathogen indicators for which the Administrator has published criteria under section 304(a).

"(B) NEW OR REVISED CRITERIA AND STANDARDS.-Not later than 36 months after the date of publication by the Administrator of new or revised water quality criteria under section 304(a)(9), each State having coastal recreation waters shall adopt and submit to the Administrator new or revised water quality standards for the coastal recreation waters of the State for all pathogens and pathogen indicators to which the new or revised water quality criteria are applicable.

"(2) FAILURE OF STATES TO ADOPT.-

"(A) IN GENERAL.-If a State fails to adopt water quality criteria and standards in accordance with paragraph (1)(A) that are as protective of human health as the criteria for pathogens and pathogen indicators for coastal recreation waters published by the Administrator, the Administrator shall promptly propose regulations for the State setting forth revised or new water

quality standards for pathogens and pathogen indicators described in paragraph (1)(A) for coastal recreation waters of the State.

"(B) EXCEPTION.-If the Administrator proposes regulations for a State described in subparagraph (A) under sub- section (c)(4)(B), the Administrator shall publish any revised or new standard under this subsection not later than 42 months after the date of the enactment of this subsection. Publication.

"(3) APPLICABILITY.-Except as expressly provided by this subsection, the requirements and procedures of subsection (c) apply to this subsection, including the requirement in sub- section (c)(2)(A) that the criteria protect public health and welfare.".

SEC. 3. REVISIONS TO WATER QUALITY CRITERIA.

(a) STUDIES CONCERNING PATHOGEN INDICATORS IN COASTAL RECREATION WATERS.-Section 104 of the Federal Water Pollution Control Act (33 U.S.C. 1254) is amended by adding at the end the following: Deadlines.

"(v) STUDIES CONCERNING PATHOGEN INDICATORS IN COASTAL RECREATION W ATERS.-Not later than 18 months after the date of the enactment of this subsection, after consultation and in cooperation with appropriate Federal, State, tribal, and local officials (including local health officials), the Administrator shall initiate, and, not later than 3 years after the date of the enactment of this subsection, shall complete, in cooperation with the heads of other Federal agencies, studies to provide additional information for use in developing-

"(1) an assessment of potential human health risks resulting from exposure to pathogens in coastal recreation waters, including nongastrointestinal effects;

"(2) appropriate and effective indicators for improving detection in a timely manner in coastal recreation waters of the presence of pathogens that are harmful to human health;

"(3) appropriate, accurate, expeditious, and cost-effective methods (including predictive models) for detecting in a timely manner in coastal recreation waters

the presence of pathogens that are harmful to human health; and

"(4) guidance for State application of the criteria for pathogens and pathogen indicators to be published under section 304(a)(9) to account for the diversity of geographic and aquatic conditions.".

(b) REVISED CRITERIA.-Section 304(a) of the Federal Water Pollution Control Act (33 U.S.C. 1314(a)) is amended by adding at the end the following:

Deadlines. Publication.

"(9) REVISED CRITERIA FOR COASTAL RECREATION WATERS.-

"(A) IN GENERAL.-Not later than 5 years after the date of the enactment of this paragraph, after consultation and in cooperation with appropriate Federal, State, tribal, and local officials (including local health officials), the Administrator shall publish new or revised water quality criteria for pathogens and pathogen indicators (including a revised list of testing methods, as appropriate), based on the results of the studies conducted under section 104(v), for the purpose of protecting human health in coastal recreation waters.

"(B) REVIEWS.-Not later than the date that is 5 years after the date of publication of water quality criteria under this paragraph, and at least once every 5 years thereafter,

the Administrator shall review and, as necessary , revise the water quality criteria.".

SEC. 4. COASTAL RECREATION WATER QUALITY MONITORING AND NOTIFICATION.

Title IV of the Federal Water Pollution Control Act (33 U.S.C. 1341 et seq.) is amended by adding at the end the following:

33 USC 1346.

Deadline.
Publication.

406. COASTAL RECREATION WATER QUALITY MONITORING AND NOTIFICATION.

"(a) MONITORING AND NOTIFICATION.-

"(1) IN GENERAL.-Not later than 18 months after the date of the enactment of this section, after consultation and in cooperation with appropriate Federal, State, tribal, and local officials (including local health officials), and after providing public notice and an opportunity for comment, the Administrator shall publish performance criteria for-

"(A) monitoring and assessment (including specifying available methods for monitoring) of coastal recreation waters adjacent to beaches or similar points of access that are used by the public for attainment of applicable water quality standards for pathogens and pathogen indicators; and

"(B) the prompt notification of the public, local governments, and the Administrator of any exceeding of or likelihood of exceeding applicable water quality standards for coastal recreation waters described in subparagraph (A).

"(2) LEVEL OF PROTECTION.-The performance criteria referred to in paragraph (1) shall provide that the activities described in subparagraphs (A) and (B) of that paragraph shall be carried out as necessary for the protection of public health and safety.

"(b) PROGRAM DEVELOPMENT AND IMPLEMENTATION GRANTS.-

"(1) IN GENERAL.-The Administrator may make grants to States and local governments to develop and implement programs for

monitoring and notification for coastal recreation waters adjacent to beaches or similar points of access that are used by the public.

"(2) LIMITATIONS.-

"(A) IN GENERAL.-The Administrator may award a grant to a State or a local government to implement a monitoring and notification program if-

"(i) the program is consistent with the performance criteria published by the Administrator under sub- section (a);

"(ii) the State or local government prioritizes the use of grant funds for particular coastal recreation waters based on the use of the water and the risk to human health presented by pathogens or pathogen indicators;

"(iii) the State or local government makes available to the Administrator the factors used to prioritize the use of funds under clause (ii);

"(iv) the State or local government provides a list of discrete areas of coastal recreation waters that are subject to the program for monitoring and notification for which the grant is provided that specifies any coastal recreation waters for which fiscal constraints

will prevent consistency with the performance criteria under subsection (a); and

"(v) the public is provided an opportunity to review the program through a process that provides for public notice and an opportunity for comment.

"(B) GRANTS TO LOCAL GOVERNMENTS.-The Administrator may make a grant to a local government under this subsection for implementation of a monitoring and notification program only if, after the l-year period beginning on the date of publication of performance criteria under subsection (a)(I), the Administrator determines that the State is not implementing a program that meets the requirements of this subsection, regardless of whether the State has received a grant under this subsection.

"(3) OTHER REQUIREMENTS.-

"(A) REPORT.-A State recipient of a grant under this subsection shall submit to +the Administrator, in such for- mat and at such intervals as the Administrator determines to be appropriate, a report that describes-

"(i) data collected as part of the program for monitoring and notification as described in subsection (c); and

"(ii) actions taken to notify the public when water quality standards are exceeded.

"(B) DELEGATION.-A State recipient of a grant under this subsection shall identify each local government to which the State has delegated or intends to delegate responsibility for implementing a monitoring and notification program consistent

with the performance criteria published under subsection (a) (including any coastal recreation waters for which the authority to implement a monitoring and notification program would be subject to the delegation).

"(4) FEDERAL SHARE.-

"(A) IN GENERAL.-The Administrator, through grants awarded under this section, may pay up to 100 percent of the costs of developing and implementing a program for monitoring and notification under this subsection.

"(B) NON-FEDERAL SHARE.-The non-Federal share of the costs of developing and implementing a monitoring and notification program may be-

"(i) in an amount not to exceed 50 percent, as determined by the Administrator in consultation with State, tribal, and local government representatives; and

"(ii) provided in cash or in kind.

"(c) CONTENT OF STATE AND LOCAL GOVERNMENT PROGRAMS.- As a condition of receipt of a grant under subsection (b), a State or local government program for monitoring and notification under this section shall identify-

"(1) lists of coastal recreation waters in the State, including coastal recreation waters adjacent to beaches or similar points of access that are used by the public;

"(2) in the case of a State program for monitoring and notification, the process by which the State may delegate to local governments responsibility for implementing the monitoring and notification program;

"(3) the frequency and location of monitoring and assess- ment of coastal recreation waters based on-

"(A) the periods of recreational use of the waters;

"(B) the nature and extent of use during certain periods;

"(C) the proximity of the waters to known point sources and nonpoint sources of pollution; and

"(D) any effect of storm events on the waters;

"(4)(A) the methods to be used for detecting levels of patho- gens and pathogen indicators that are harmful to human health; and

"(B) the assessment procedures for identifying short-term increases in pathogens and pathogen indicators that are harm- ful to human health in coastal recreation waters (including increases in relation to storm events);

"(5) measures for prompt communication of the occurrence, nature, location, pollutants involved, and extent of any exceeding of, or likelihood of exceeding, applicable water quality standards for pathogens and pathogen indicators to--

"(A) the Administrator, in such form as the Administrator determines to be appropriate; and

"(B) a designated official of a local government having jurisdiction over land adjoining the coastal recreation waters for which the failure to meet applicable standards is identified;

"(6) measures for the posting of signs at beaches or similar points of access, or functionally equivalent communication measures that are sufficient to give notice to the public that the coastal recreation waters are not meeting or are not expected to meet applicable water quality standards for pathogens and pathogen indicators; and

"(7) measures that inform the public of the potential risks associated with water contact activities in the coastal recreation waters that do not meet applicable water quality standards.

Deadline.

"(d) FEDERAL AGENCY PROGRAMS.-Not later than 3 years after the date of the enactment of this section, each Federal agency that has jurisdiction over coastal recreation waters adjacent to beaches or similar points of access that are used by the public shall develop and implement, through a process that provides for public notice and an opportunity for comment, a monitoring and notification program for the coastal recreation waters that-

Reports.

Public Information.

"(1) protects the public health and safety;

"(2) is consistent with the performance criteria published under subsection (a);

"(3) includes a completed report on the information specified in subsection (b)(3)(A), to be submitted to the Administrator; and

"(4) addresses the matters specified in subsection (c) .

"(e) DATABASE.-The Administrator shall establish, maintain, and make available to the public by electronic and other means a national coastal recreation water pollution occurrence database that provides-

"(1) the data reported to the Administrator under sub- sections (b)(3)(A)(i) and (d)(3); and

"(2) other information concerning pathogens and pathogen indicators in coastal recreation waters that-

"(A) is made available to the Administrator by a State or local government, from a coastal water quality monitoring program of the State or local government; and

"(B) the Administrator determines should be included.

"(f) TECHNICAL ASSISTANCE FOR MONITORING FLOATABLE MATE- RIAL.-The Administrator shall provide technical assistance to States and local governments for the development of assessment and monitoring procedures for floatable material to protect public health and safety in coastal recreation waters.

"(g) LIST OF WATERS.-

Deadline.

"(1) IN GENERAL.-Beginning not later than 18 months Deadline. after the date of publication of performance criteria under subsection (a), based on information made available to the Administrator, the Administrator shall identify , and maintain a list of, discrete coastal recreation waters adjacent to beaches or similar points of access that are used by the public that-

Public Information.
Federal Register, Publication.

"(A) specifies any waters described in this paragraph that are subject to a monitoring and notification program consistent with the performance criteria established under subsection (a); and

"(B) specifies any waters described in this paragraph for which there is no monitoring and notification program (including waters for which fiscal constraints will prevent the State or the Administrator from performing monitoring and notification consistent with the performance criteria established under subsection (a)).

"(2) AVAILABILITY.-The Administrator shall make the list Public described in paragraph (1) available to the public through- information.

"(A) publication in the Federal Register; and

Federal Register

"(B) electronic media. publication.

"(3) UPDATES.-The Administrator shall update the list described in paragraph (1) periodically as new information becomes available.

"(h) USEPA IMPLEMENTATION.-In the case of a State that has no program for monitoring and notification that is consistent with the performance criteria published under subsection (a) after the last day of the 3-year period beginning on the date on which the Administrator lists waters in the State under subsection (g)(I)(B), the Administrator shall conduct a monitoring and notification program for the listed waters based on a priority ranking established by the Administrator using funds appropriated for grants under subsection (i)-

"(1) to conduct monitoring and notification; and

"(2) for related salaries, expenses, and travel.

"(i) AUTHORIZATION OF APPROPRIATIONS.- There is authorized to be appropriated for making grants under subsection (b), including implementation of monitoring and notification programs by the Administrator under subsection (h), $30,000,000 for each of fiscal years 2001 through 2005.".

SEC. 5. DEFINITIONS.

Section 502 of the Federal Water Pollution Control Act (33 U.S.C. 1362) is amended by adding at the end the following:

"(21) COASTAL RECREATION WATERS.-

"(A) IN GENERAL.-The term 'coastal recreation waters' means-

"(i) the Great Lakes; and

"(ii) marine coastal waters (including coastal estuaries) that are designated under section 303(c) by a State for use for swimming, bathing, surfing, or similar water contact activities.

"(B) EXCLUSIONS.- The term 'coastal recreation waters' does not include-

"(i) inland waters; or

"(ii) waters upstream of the mouth of a river or stream having an unimpaired natural connection with the open sea.

"(22) FLOATABLE MATERIAL.-

"(A) IN GENERAL.- The term 'floatable material' means any foreign matter that may float or remain suspended in the water column.

"(B) INCLUSIONS.-The term 'floatable material' includes-

"(i) plastic;

"(ii) aluminum cans;

"(iii) wood products;

“(iv) bottles; and

"(v) paper products.

"(23) PATHOGEN INDICATOR.-The term 'pathogen indicator' means a substance that indicates the potential for human infectious disease.".

SEC. 6. INDIAN TRIBES.

Section 518(e) of the Federal Water Pollution Control Act (33 U.S.C. 1377(e)) is amended by striking "and 404" and inserting "404, and 406".

33 USC 1375a. Deadline.

SEC. 7. REPORT.

(a) IN GENERAL.-Not later than 4 years after the date of the enactment of this Act, and every 4 years thereafter, the

Administrator of the Environmental Protection Agency shall submit to Congress a report that includes-

(1) recommendations concerning the need for additional water quality criteria for pathogens and pathogen indicators and other actions that should be taken to improve the quality of coastal recreation waters;

(2) an evaluation of Federal, State, and local efforts to implement this Act, including the amendments made by this Act; and

(3) recommendations on improvements to methodologies and techniques for monitoring of coastal recreation waters. (b) COORDINATION.-The Administrator of the Environmental Protection Agency may coordinate the report under this section with other reporting requirements under the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.).

SEC. 8. AUTHORIZATION OF APPROPRIATIONS.

There are authorized to be appropriated to carry out the provisions of this Act, including the amendments made by this Act, for which amounts are not otherwise specifically authorized to be appropriated, such sums as are necessary for each of fiscal years 2001 through 2005.

Approved October 10, 2000

LEGISLATIVE HISTORY-H.R. 999 (S. 522):

HOUSE REPORTS: No.106-98 (Comm. on Transportation and Infrastructure).

SENATE REPORTS: No.106-366 accompanying S. 522 (Comm. on Environment and Public Works).

CONGRESSIONAL RECORD:

Vol. 145 (1999): Apr. 22, considered and passed House.

Vol. 146 (2000): Sept. 21, considered and passed Senate, amended. Sept. 26, House concurred in Senate amendment.

WEEKLY COMPILATION OF PRESENTIAL DOCUMENTS, Vol. 36 (2000):

Oct. 10, Presidential statement.

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APPENDIX E

MDPH BEACH SAMPLING DATA FORM

Beach Sampling Field Data Form

Town/City of Collection: **Date Collected:** **Collected By:**	**Time Delivered to Lab:** **Delivered By:** **Relinquished To:**

Instructions: Collect sample(s) in areas of greatest bather load and at locations subject to contamination at a uniform depth of 3 feet. Collect samples 12 inches below water surface. Do not collect samples within 6 inches of bottom.

Sample ID	Location (Note beach and sampling location)	Time of Sample	Water					Air					Observations of bathing water[4]
			Type: Salt/Fresh	Temp °F	Clarity[1] C / NC	Bather Density[2]	Last High Tide (if applicable)	Weather[3]	Temp °F	Wind Direction	Amount of Last Rain	Days Since Rain	

[1] **Water Clarity:** **C=Clear** **NC=Not Clear** If reason is known, specify under observations.
[2] **Bather Density:** **01**=(0-10 bathers) **02**=(11-20 bathers) **03**=(20-50 bathers) **04**=(>50 bathers)
[3] **Weather**: **S**=Sunny **C**=Cloudy/Overcast **R**=Rainy **F**=Foggy **W**=Windy
[4] **Observations**: **T**=Trash **WS**=Waste Solids **SD**=Sludge Deposit **O**=Oils **A**=Algae **F**=Fish die-offs **J**=Jellyfish **B**=Birds **D**=Dogs

Comments:

Please Note: This form MUST be utilized upon collection of samples and filled out in its entirety. For reporting purposes, a copy must be submitted to MDPH with any lab results.